

Patent Insights Metabolic Health

Report dated 10 June 2020

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1. INTRODUCTION



1.1. Executive Summary

1

We identify 264 newly published patents since our last report in March 2019 that we consider are relevant to metabolic health. There is very strong growth in Metabolic Health when we look over the past 20 years.

2

The strong growth has been driven, particularly in the last three years, by China and Korea, much like the other HVN platforms. Of the 264 patents, 137 are from China, 77 from Korea, 10 from Japan, and only 9 from USA. We identified one New Zealand patent from University of Otago that we highlight in our [Case Study 1](#).

3

We see a healthy increase in number of applicants over time, not just the same companies filing new patents. This supports there is confidence in the consumer demand and health need, and still with ability to innovate and differentiate against competitors. The fact that so many metabolic health patents are arising from China supports that this demand is especially strong in our key export market.

8

We will be hosting webinars through Tranche 2 to dig deeper into areas of interest in this patent landscape, so keep an eye out for the announcements!

4

Research institutes contributed to almost half of the 264 patents that we identified of relevance. That is quite a spectacular result. Because of this academic involvement, most of the patents are supported by human, animal or *in vitro* trials. This supports HVN's approach, and value, of science led innovation to justify metabolic health benefits.



7

Other than kumara, we see no patents centred on, or mentioning indigenous NZ plants for metabolic health. Yet there are some patents which rely on bioactives that we can draw parallels and learnings from. This is encouraging because it supports a “white space opportunity” for differentiation.

6

Out of the metabolic health diseases, there is a strong focus on Type II diabetes, pre-diabetes and glycaemic control. In terms of wholefoods, milk, kumara, and marine-derived foods all featured strongly supporting these products have strong opportunities and market pull.

Surprisingly, probiotics were the top bioactive, which we discuss in [Case Study 1](#). We also highlight algae as a new bioactive opportunity in [Case Study 2](#).

5

[In our Spotlight section](#), we share our insights into 26 patents that we think are of particular interest to the HVN community, to help guide approaches to our HVN projects.

1.2. Purpose and Outputs of this Report



Provided by [HVN's Science of Food Platform](#), the purpose of this report is to provide HVN members with an update outlining patent insights and trends in food based approaches to immune health since the March 2019 report. The outputs of this report are:

- an executive summary;
- patent trends and insights over the past year, and in comparison to the landscape over the past 20 years;
- spotlight on key patents and case studies with take-home messages for HVN; and
- details and access (through web-links) to each new patent in this review period.

This report should not be taken as specific advice relating to your intellectual property strategy, freedom to operate, commercial or legal matters. You should always seek your own independent advice relating to your situation. IPSynergy is happy to help.

1.3. Subject Matter Focus

Relevant patents included in this report are patents published after 23 March 2019, providing metabolic health outcomes through food/beverage interventions. We excluded patents if they were focused on pharmaceutical drugs, therapeutic treatments of disease states (opposed to preventative approaches of interest), synthetic compounds / molecules, recombinant technology or genetically engineered material, non-human animal treatments, non-oral routes of intervention, and diagnostics.

Bull's Eye patents relate to glycaemic control, prevention of pre-diabetes or diabetes using foods, nutrients or bioactives that have links to New Zealand's food industry.

Halo patents are related more-so to other metabolic health conditions including fatty liver, thin-on-outside, fat-on-inside (TOFI), thermogenic foods and whole diet approaches to metabolic health.

Background patents are those that a) may reference diabetes as a potential health outcome, but are not directed towards it, b) utilise probiotics as a bioactive, or c) hypertension, hyperlipidaemia, stroke, "triple high", obesity and body composition.

NB: We have also separated out patents that rely on traditional herbal medicine approaches to metabolic health because of the huge number of results. We comment briefly on these in [Section 2.8](#), and are happy to review with anyone interested.

2. PATENT TRENDS IN METABOLIC HEALTH



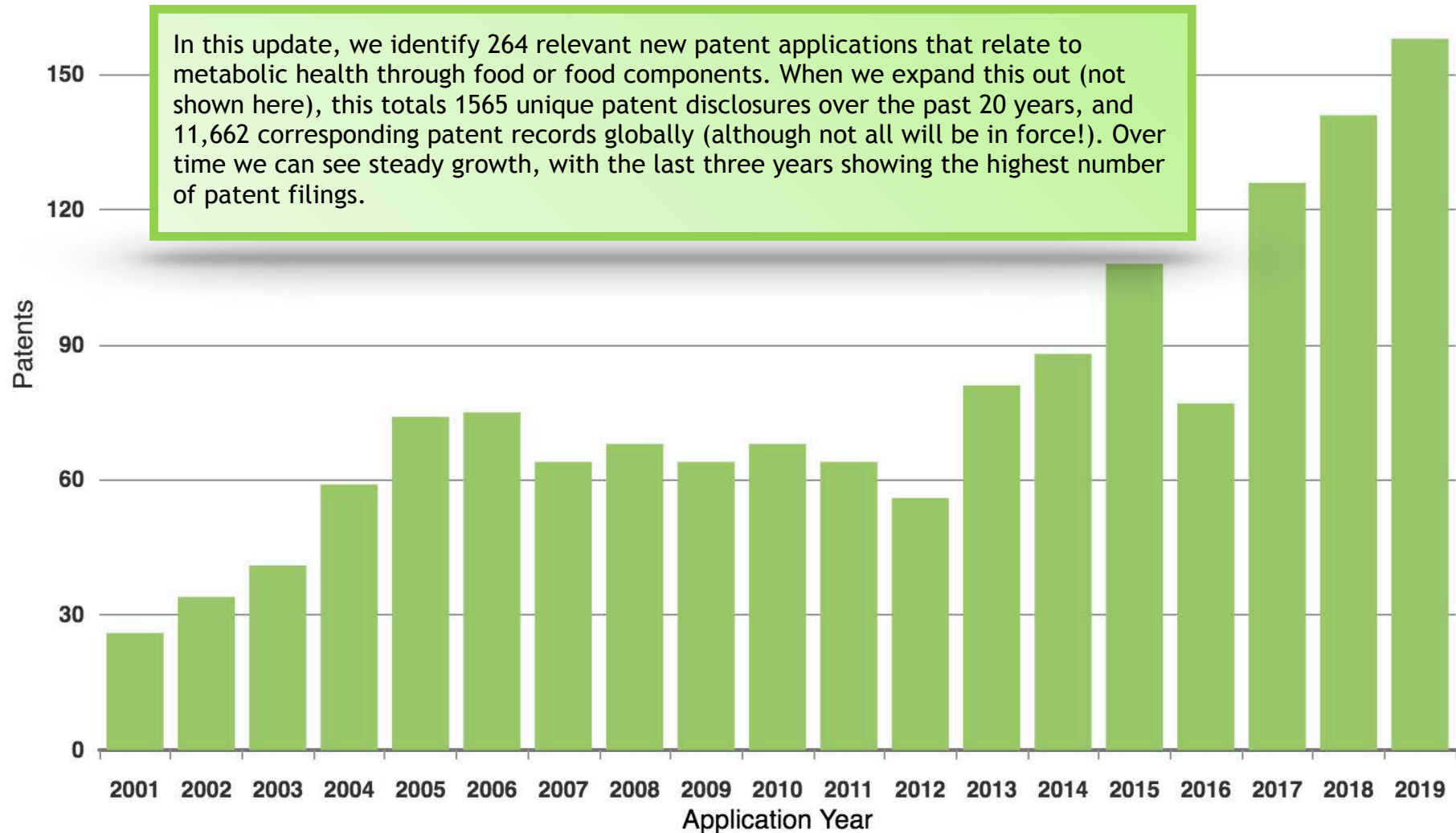
Quick tip: We can interrogate the data generated for this report to answer any specific questions for HVN members beyond the insights shown here. Please get in touch with Peter at IPSynergy (peter.brown@ipsynergy.co.nz) to discuss any burning questions.

IPSynergy has generated the analytics in this report using its access to:

patSnap

 **discovery**

2.1. Overall Patent Application Trend in Metabolic Health (past 20 years)

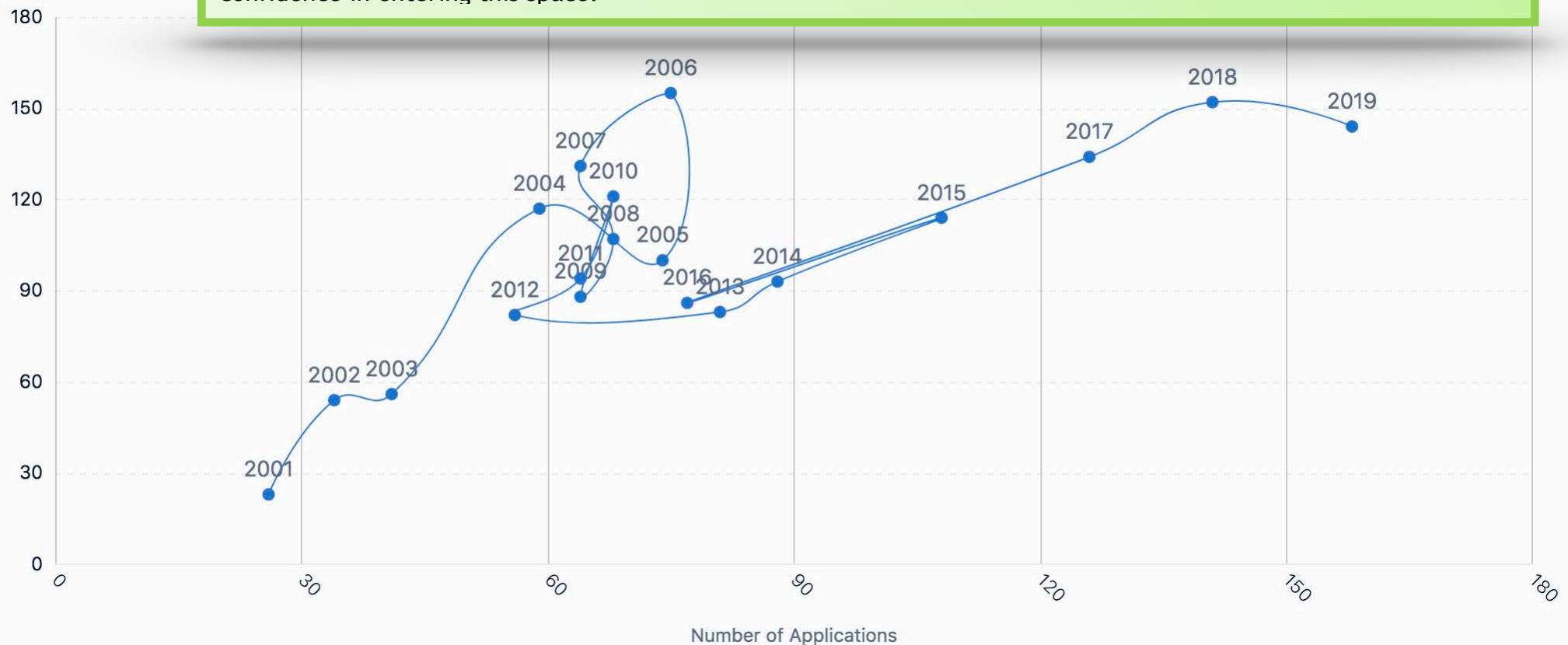


2.2. Technology Lifecycle Analysis (past 20 years)

Here we look at the technology lifecycle for our metabolic health patent landscape. The key takeaway is that over the past 20 years, we see a gradual increase in both the number of new patent applications as well as the number of Applicants.

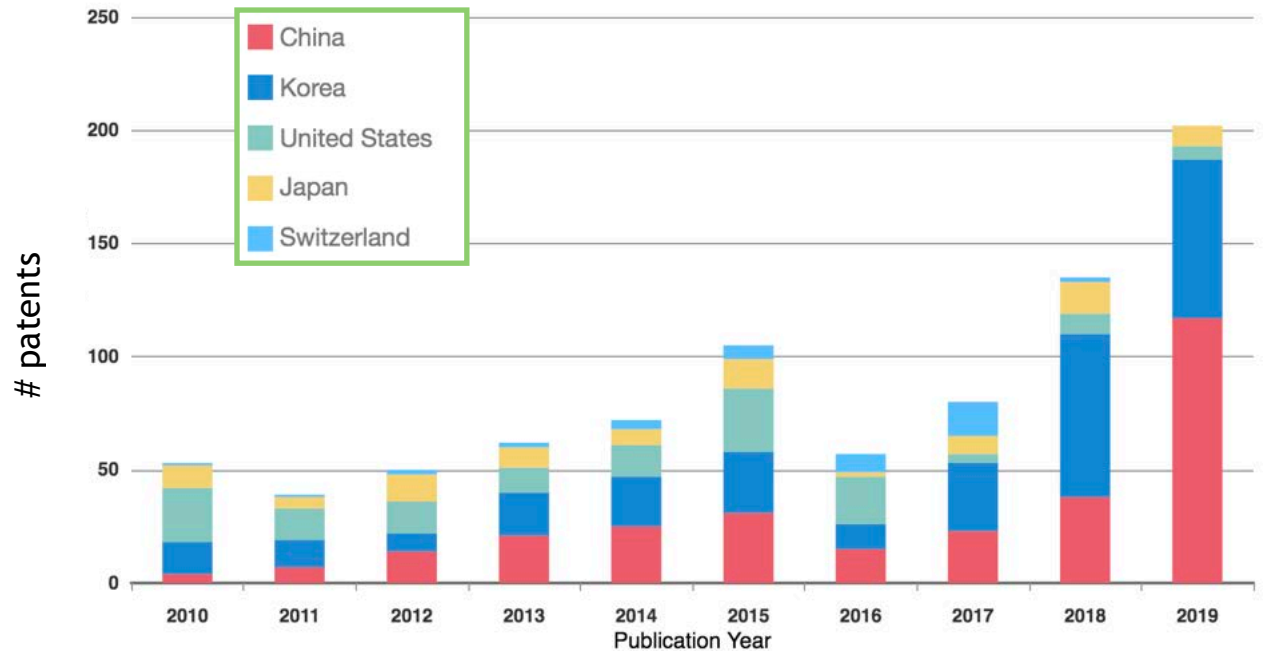
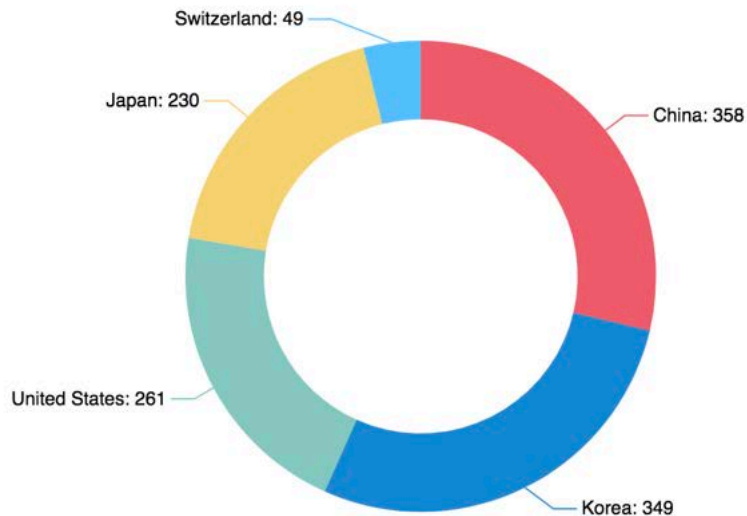
This tells us there is a healthy platform with many players that see value and have confidence in entering this health platform. It is not dominated by just a few multinationals. Therefore, companies in NZ should have confidence in entering this space.

Number of Assignees

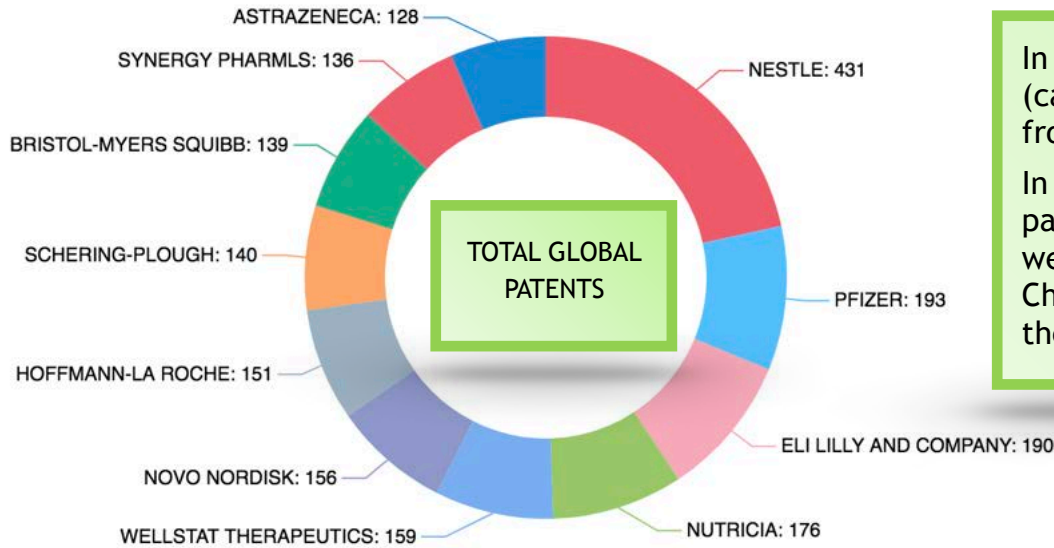


2.3.Countries Generating the Most Innovation (past 20 years)

These graphs speak a 1000 words. As shown on the right, USA had previously been a significant contributor to new patent inventions up to about 2016. However, since then, we have seen less contribution from USA, and a massive increase from both China and South Korea players. On the left, you can see China and Korea now contribute more than half of the innovation (based on published patents), strongly suggesting there is a consumer demand in these countries for food based metabolic health products. This further supports HVN’s focus on Asia for export opportunities for metabolic health.



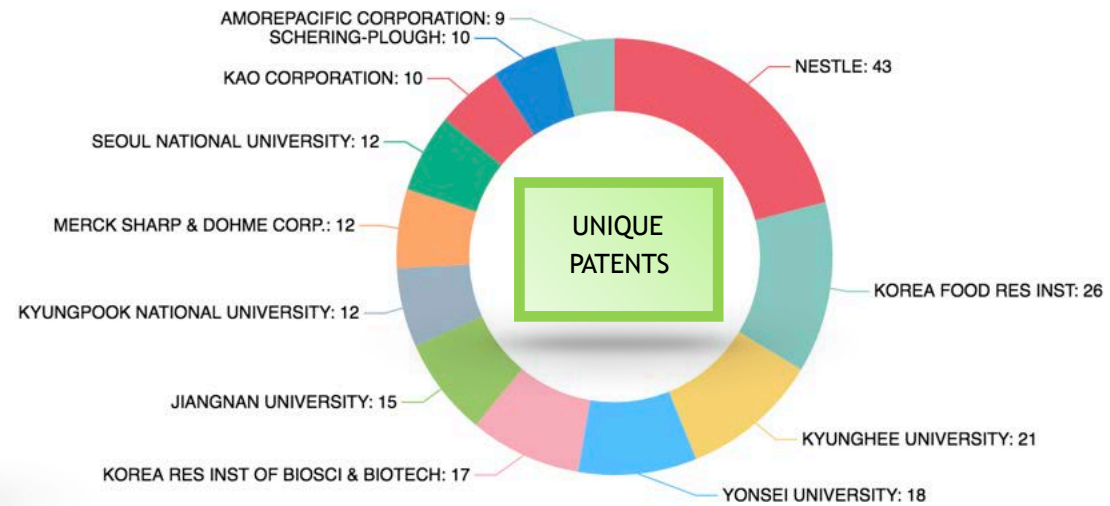
2.4.Ranking of Applicants in Metabolic Health Patent Landscape (past 20 years)



In this graph to the left, we rank companies by **total patents filed** (can include many patents filed globally for the same innovation) from the past 20 years.

In the past two decades, companies have tended to lodge their patents in conventionally big markets USA, Europe and Japan; but we are now starting to see greater emphasis on lodging patents into China and S Korea as important commercial markets, also reflecting the insights from the previous page regarding Asian filers.

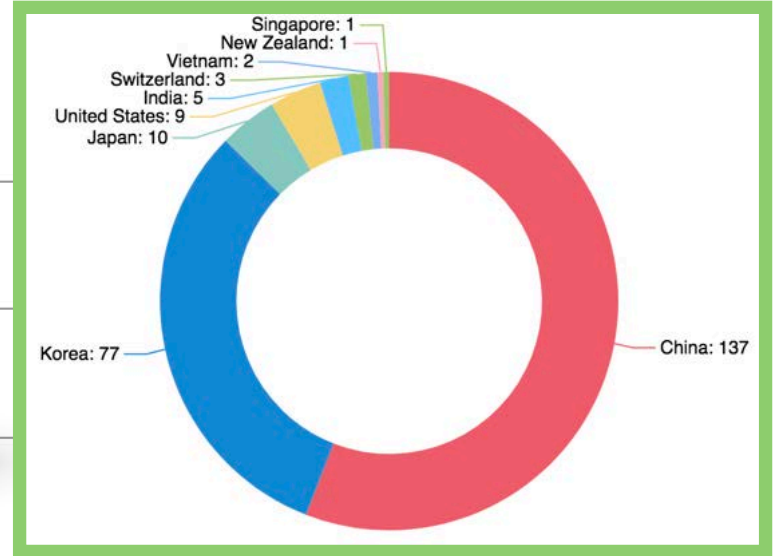
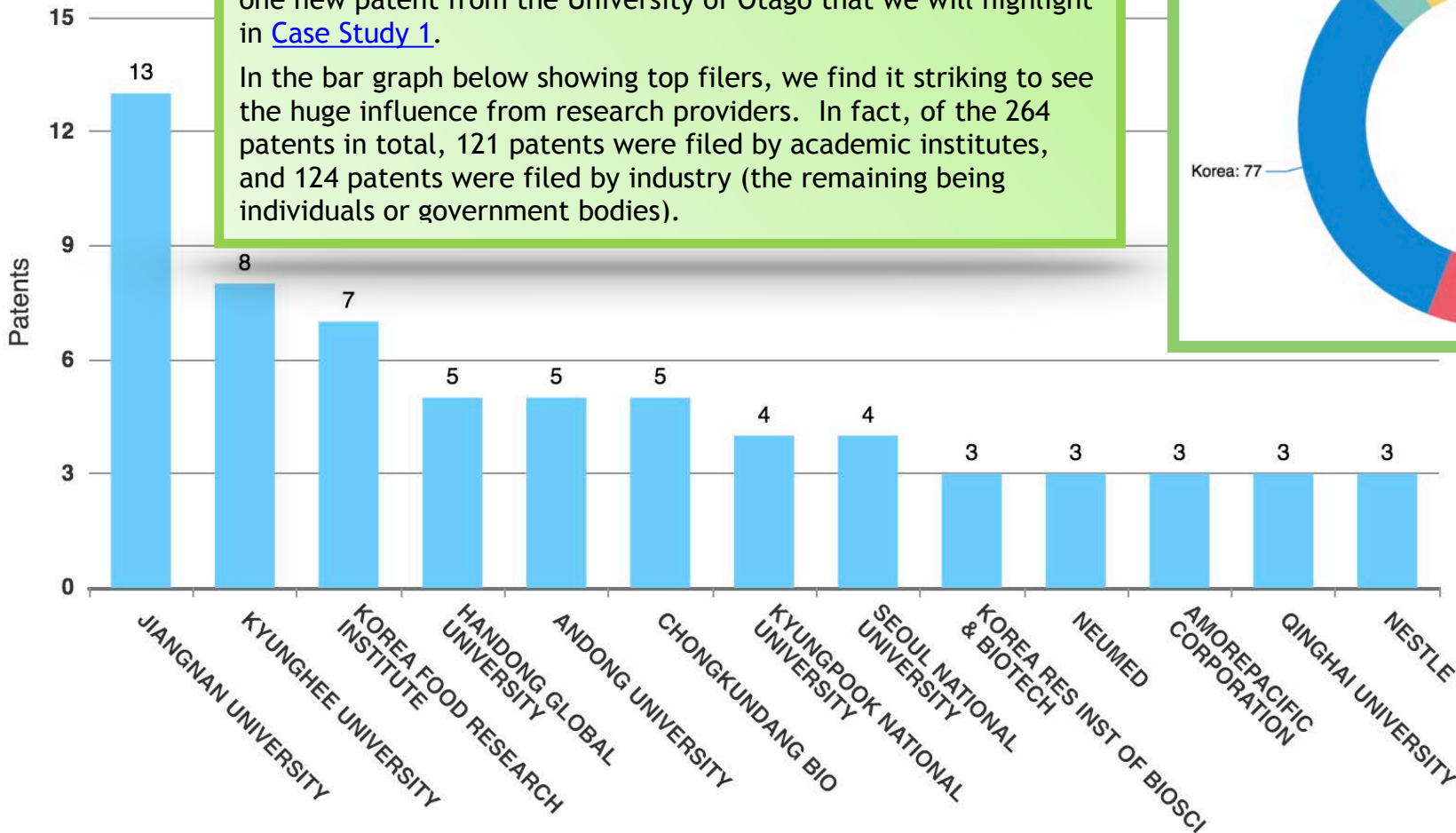
In this graph to the right, we rank companies by **number of unique patents** over the past 20 years (not biased towards large patent families of multinationals). What is remarkable when looking through this lens is the strong presence of a) China and Korea based filers and b) universities and research institutes, which outrank many multi-nationals.



2.5. Top Applicants And Regions (past 12 months)

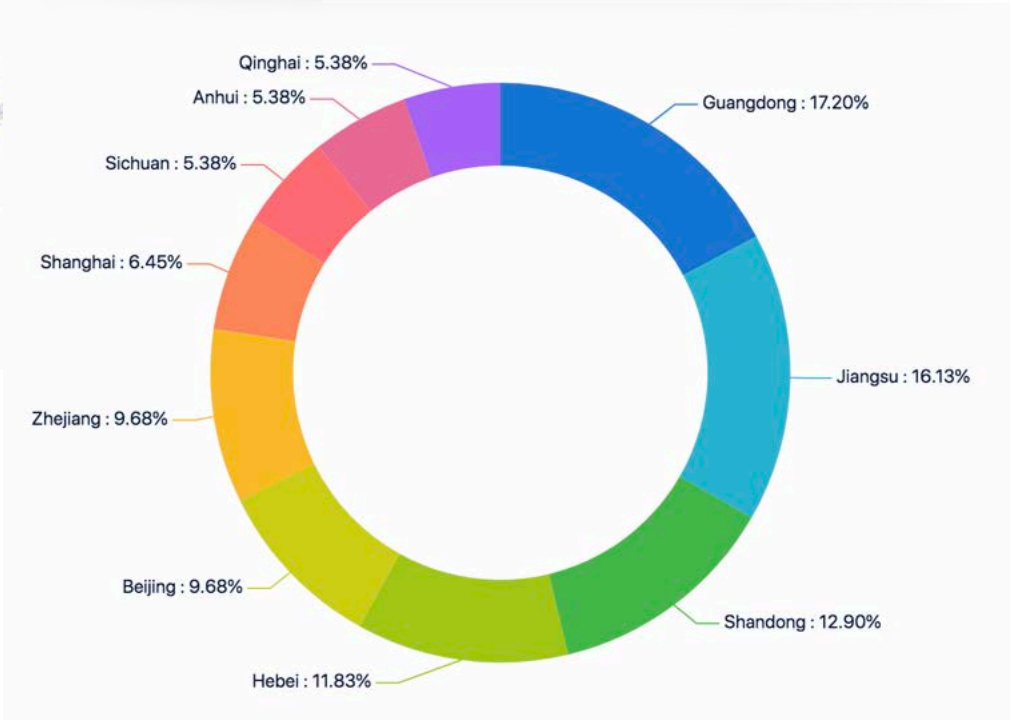
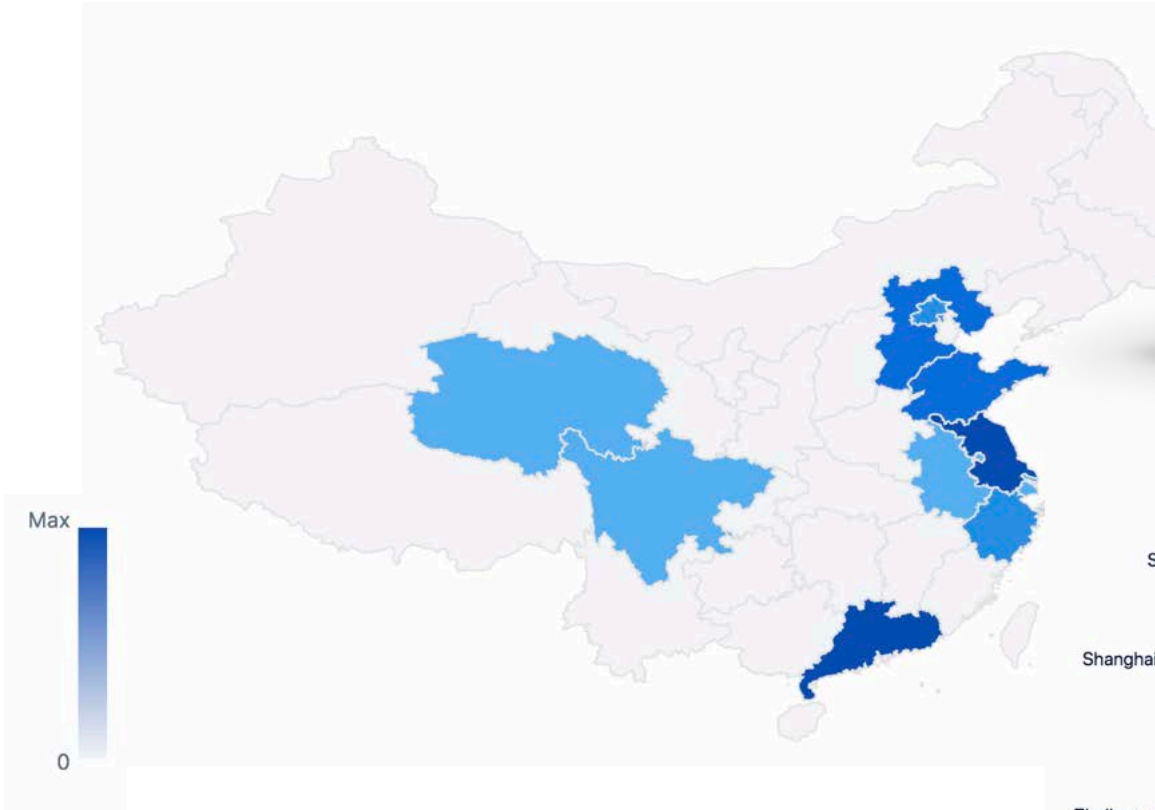
Shown to the right, in this review period, 214 of the 264 patents originated from either China or Korea. A further 10 came from Japan, and USA contributed only nine. New Zealand contributed one new patent from the University of Otago that we will highlight in [Case Study 1](#).

In the bar graph below showing top filers, we find it striking to see the huge influence from research providers. In fact, of the 264 patents in total, 121 patents were filed by academic institutes, and 124 patents were filed by industry (the remaining being individuals or government bodies).



2.6.Chinese Patent Applications by Province (past 12 months)

When we scan across the 137 Chinese applications relating to metabolic health over this review period, we see that the Guangdong province contributes the most innovation based on the number of patent filings. This signals areas within China where the metabolic health foods may be of greatest interest.



2.7. Patent Word Cloud - Chinese Patents (past 12 months)



When we look at the 137 patents arising from China (as our key export market), we can see some of the key themes based on the number of times the terms are mentioned throughout the patents. This helps us to visualise food health relationships relevant in China. This does not include any traditional herbal medicine based patents which have been extracted out and shown on the next page for reference only.

Blood pressure, Type II diabetes and lipid metabolism feature strongly for disease targets, and we start to see greater influence of microbial / probiotic based approaches mentioned.

2.8. Word Cloud - Traditional Herbal Medicine Patents (last 12 months)

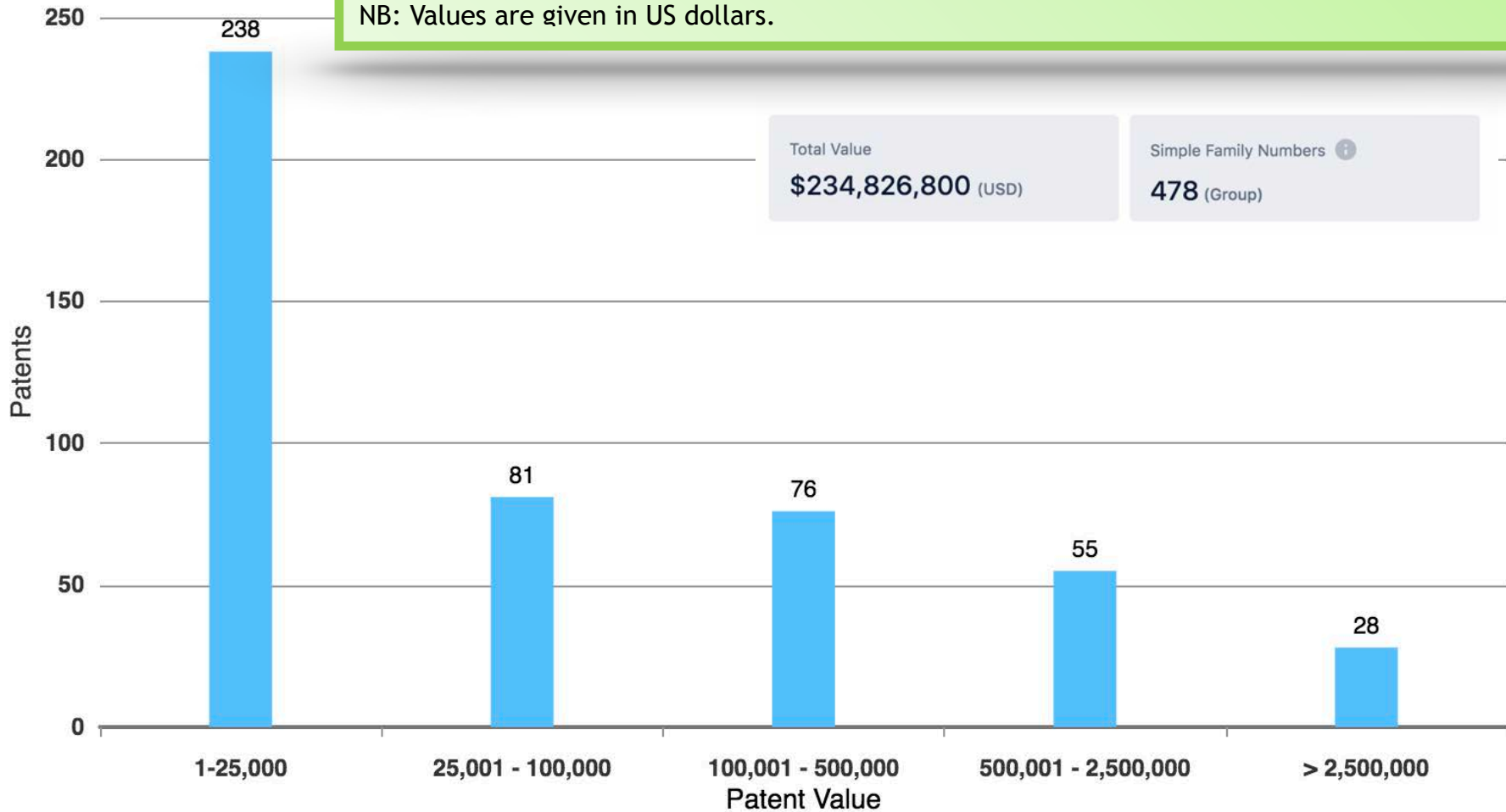
It is important to still understand the health targets and key ingredients of THM based patents used at a high level, which we show in the Word Cloud below. However, we have separated out a plethora of 593 newly filed patents in this review period, and is not part of the 264 patents deemed most relevant. These arise from Asia, primarily from China. Importantly, "blood pressure" was mentioned in 146 patents, "diabetes" (or associated terms) mentioned in 122 patents, "blood fat" mentioned in 119 patents, and fatty liver mentioned in only 12 patents.

Very interestingly the top food mentioned in THM patents was Chinese yam, in 48 patents. This gives us confidence that related root vegetables such as kumara will hold significant value in Chinese consumers's minds based on the use of yam in THM products. Note that Chinese yam was also mentioned in 19 of the 137 non-THM based Chinese patents we identified out of our core 264 patents reported in this review period.

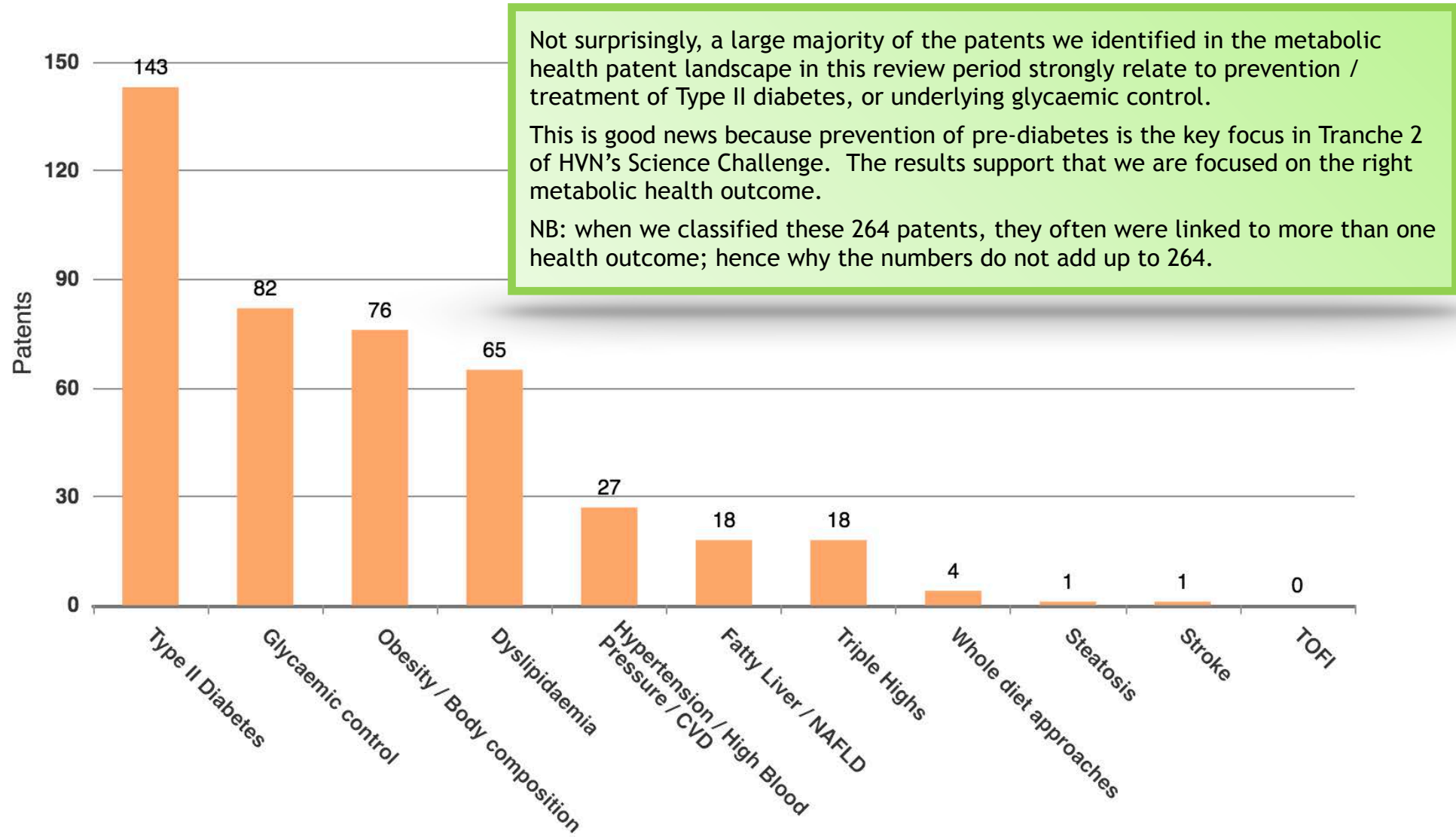


2.9. Patent Values of Metabolic Health Patents (past 20 years)

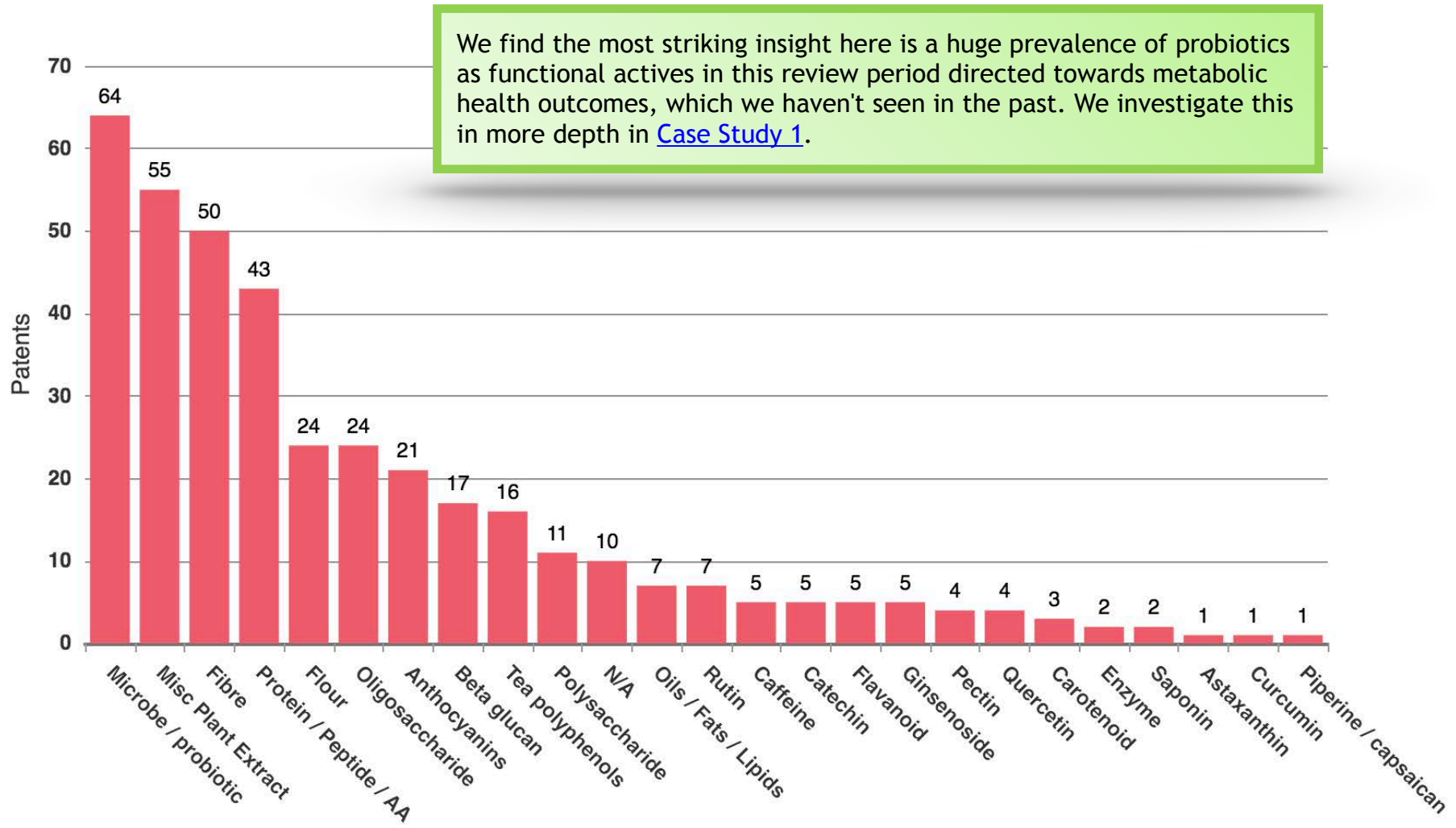
PatSnap’s algorithm takes into account market coverage, market attractiveness, technology quality, company score and legal score of the patents. 478 of 1565 total patent families in the Metabolic Health landscape have a value assigned to them based on PatSnap’s criteria.
 NB: Values are given in US dollars.



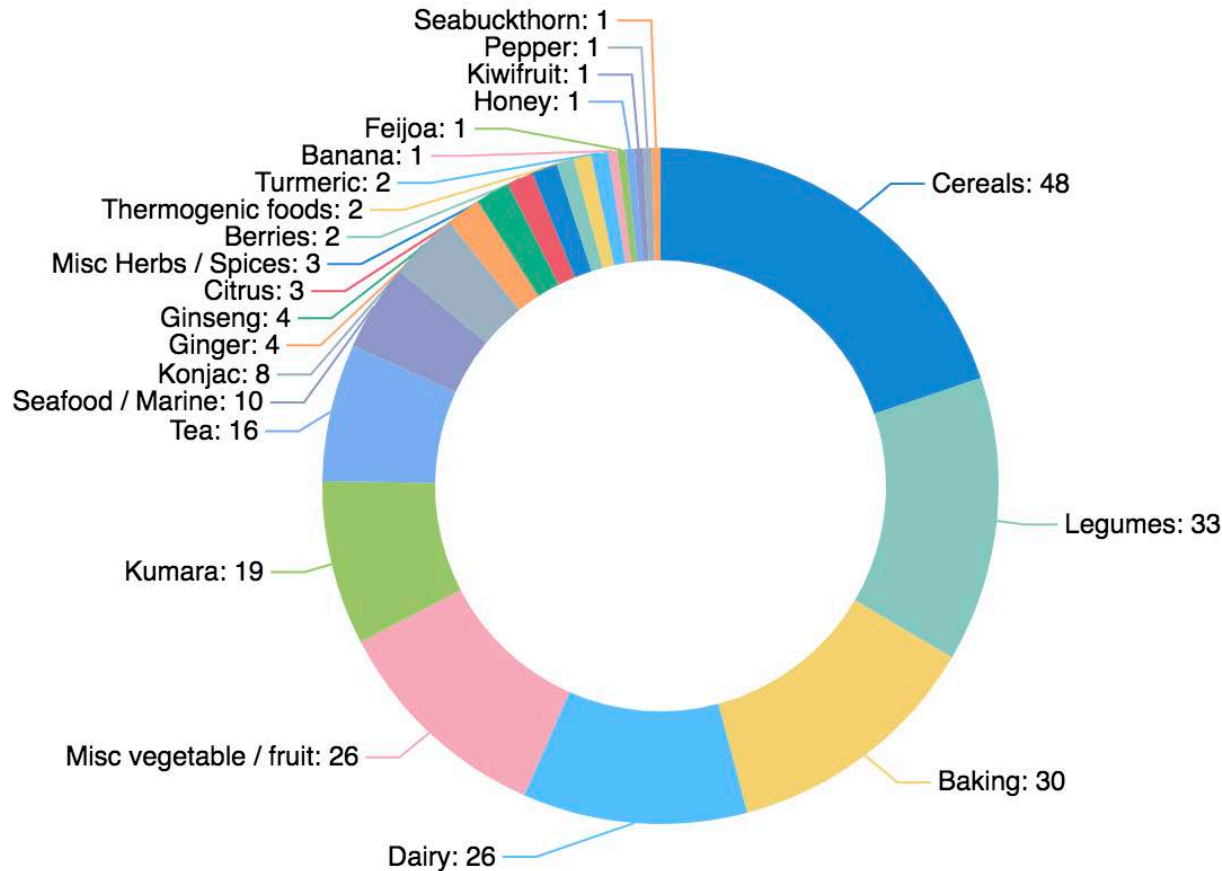
2.10. Health Outcomes Linked to Metabolic Health (past 12 months)



2.11. Functional Actives Linked to Metabolic Health (past 12 months)



2.12. Food Links in the Metabolic Health Patent Landscape (past 12 months)



Across the 264 relevant patents in this review period (not including THM based patents), we see a good spread of food linkages that we in NZ can utilise in our pipeline.

Looking at it from one angle, we can gain confidence that dairy, kumara and to a lesser extent marine based food, are significant foods seen in the metabolic health patent landscape, supporting the market potential and demand. On the flip-side there will be more competition and potential freedom to operate issues to navigate.

Looking from another angle, foods like kiwifruit, berries, and honey are not widely relied on widely for metabolic health outcomes. This is good from the perspective of potentially being more differentiated in the market, but caution should be taken about consumer perception / demand and validation of the science.

3.SPOTLIGHT ON SELECTED PATENTS

Title	IPSYNERGY ® INSIGHTS	Owner	Link
Olive oil enriched with oleanolic acid, process for its preparation and use thereof	This patent from CSIC in Italy , also a key player in COVID-19 research, is quite a significant breakthrough. In this related press release , CSIS reported the research team has shown that an olive oil enriched with oleanolic acid has benefits towards Type II diabetes in a large human clinical trial with 176 prediabetic individuals. Patients ingested 55 milliliters of the functional olive oil daily, and showed a 55 % reduction in the risk of developing type 2 diabetes compared to the same unenriched commercial olive oil.	Csic Superior Council Of Scientific Investigations Andalusian Health Service	EP3593651A1
A Composition Comprising Extract of Red Ginseng for Preventing or Improving Metabolic Diseases	The use of ginseng extract for preventing dislipidemia offers an interesting opportunity for a NZ's ginseng producer Ginsenz. In November 2019, an article highlighted NZ's ginseng has 50% more ginsenosides compared to Northern hemisphere grown ginseng, as investigated by Massey researchers.	Jinan Hongsam Res Inst	KR1020190076927A
Asparagus extract as well as preparation method and application thereof	Here, Nanjing Medical University proposes use of an asparagus extract rich in saponin to target dyslipidemia. This is the same active agent as found in indigenous plants like Kūmarahou in NZ, offering us potential insights for projects here. Unfortunately, there is no clinical data in this patent.	Qinhuangdao Changsheng Nutrition Health Technology Co., Ltd Nanjing Medical University	CN110075229A
Composition and method for suppressing increase in blood glucose level	Suntory has utilised this hops derived flavonoid and proven in high fat diet mice clinical trial that insulin resistance is suppressed through changes in the gut microbiome. A recent publication is linked to this research.	Suntory	WO2020031952A1
Oat seedling kiwi beverage and preparation method thereof	This is one of the only examples seen in our metabolic landscape of use of kiwifruit combined with oats, although it is unclear how similar this is to our NZ varieties.	Beijing Univ Of Agri	CN110419653A



Title	IPSYNERGY ® INSIGHTS	Owner	Link
Composition containing, as active ingredient, green tea extract with increased polysaccharide content	Linked to this patent, Amorepacific has published its findings relating to polysaccharides from green tea , and its links to health and wellness. It has recently invested in a further R&D centre relating to developing a new green tea derived probiotic. In NZ, companies like Zealong Tea has a an opportunity to establish and leverage unique polysaccharides that could have similar properties.	Amorepacific Corporation	WO2019098553A2
Slow-digestion potato porridge rich in grape seed proanthocyanidin and preparation method thereof	The inventors conducted <i>in vitro</i> digestion experiments to support slow-digestion of their porridge based on potato and grape seed. HVN's Science of Food team has expertise to study digestion kinetics of foods, and their link to potential metabolic health benefits.	Zhejiang University	CN110292159A
Imitated rice and preparation method thereof	This patent describes the use of potato to prepare imitation rice with low GI effect and weight loss. Although the patent has no supporting clinical data, it still provides insights into a commercial opportunity in Asia we could potentially take with NZ kumara to avoid issues with glucose spikes from rice.	Hebei North Univ	CN110037262A
Pharmaceutical composition comprising extract of fermented ginger for prevention or treatment of metabolic disease	This patent compares the benefits of fermented ginger extracts to normal ginger extracts, with clinical date showing improvements to metabolic health outcomes. We should also consider opportunities to leverage our fermentation expertise to help boost metabolic health effects of nutrients and foods.	Univ Ind Cooperation Group Of Kyunghee Univ	KR1020200032007A
Oligo-saccharide enhanced milk products having the functions of modulating blood lipid, improving intestinal flora and promoting immunity, and process for preparing the same	We also discussed this patent in our Immunity Patent Insights report this year. It is interesting because it uses enzymatic action to convert lactose (an allergen) into prebiotic galacto-oligosaccharides not only with digestive health and immunity benefits, but also metabolic health outcomes, in particular by providing a low GI milk product.	V Prods Corp	US20190090500A1



Title	IPSYNERGY ® INSIGHTS	Owner	Link
Dietary supplement for glycemia control and diabetes prevention	This patent borders on being THM based, including a combination of astragalus root, phlorizin, root bark of white mulberry, olive leaf, and bitter melon. We are highlighting this one specifically because the patent has compelling clinical data to support glycemic protection, which is rather unusual for THM based patents. Further, the Applicant have taken the unusual strategy of filing the original patent application in the USA (quite different to most Chinese applications which often are only filed in China). Albeit, we cannot find any information on the owner, World Pharm Tech LLC, suggesting this is a new player in the market taking a unique approach to THM foods.	World Pharm Tech Llc	US20200146325A1
Pharmaceutical composition comprising the extract of an unripe apple as an effective component for prevention or treatment of diabetes and health functional food comprising the same	This Korean patent describes the use of extracts from an unripe apple with clinical data to support potent β -amylase (α -glucosidase) inhibitory. The company behind the patent conducts extensive research into agricultural based innovation. In NZ we need to start considering opportunities such as this to increase value proposition of our apple export market.	Cheongsong Gun Agri Tech & Extension Cent	KR1020200038700A
Composition for Preventing or Treating Diabetes Comprising Beeswax-Coated Bee Venom Beads As Active Ingredient	This patent uses a rather radical approach to preventing diabetes using bee venom constructed as beads, and coated in beeswax, with potential application in foods. Despite the unique approach, we could find no press release or details about the company behind this technology.	Ahn Chang-gi	KR1020200031811A
Pharmaceutical composition comprising the extract of perilla leaf as an effective component for prevention or treatment of diabetes and health functional food comprising the same	This Korean applicant uses sesame leaf extract to target diabetes prevention. It is based on amylase (β -amylase) and alpha-glucosidase inhibition.	Andong University Industry-Academic Cooperation Foundation	KR1020200021707A
Method for efficiently preparing citrus pectin with relieving of type II diabetes	This patent has been filed by a large Chinese research institute. This innovation is based on the use of pectin from citrus for glycemic modulation, with supporting data from mouse models. We see this as having obvious parallels with NZ fruits such as feijoa that are also high in pectin.	Inst Of Agro Food Sci & Tech Chinese Academy Of Agri Sci	CN110652013A



Title	IPSYNERGY ® INSIGHTS	Owner	Link
Use of polar lipids to treat or prevent gestational diabetes mellitus	The only NZ patent in this year's update, Fonterra describes the use of milk-based polar lipids, such as phospholipids, gangliosides, ceramides, cerebrocides, or milk fat globule membrane (MFGM), optionally together with a probiotic (e.g. Lactobacillus rhamnosus HN001) to prevent or treat gestational diabetes. This follows the development of Fonterra's probiotic strain for preventing gestational diabetes .	Fonterra Coop Group	WO2019244137A1
Application of astaxanthin in preparation of glucosidase inhibitor	This patent describes use of astaxanthin as a bioactive to reducing blood glucose. The astaxanthin is sourced and isolated from yeast. Xiping Du, co inventor on this patent, is a PI at Jimei University in China and has been studying astaxanthin for some time.	Jimei Univ	CN110327316A
Hypoglycemic polypeptide and preparation method and application thereof	This is a fascinating approach taken by researchers at Shanxi University in China. They have extracted a polypeptide from carrots and shown <i>in vitro</i> that it has blood glucose modulating effects. The researchers have also successfully replicated the polypeptide using recombinant technologies, allowing them to scale the innovation using synthetic approaches. There are obvious opportunities here to leverage the humble carrot for high value foods, where its key bioactive carotene is also known to have anti-diabetes effects .	Shanxi University	CN110317251A
Food additive rich in selenium, polysaccharide and polysaponin, preparation method and application thereof	Another Chinese example of utilisation of the bioactive saponin through extraction from yam, and combined with polysaccharide from grapefruit skin, providing blood lipid and sugar lowered effects. The linkage here is that Kumara and Kūmarahou both have saponin components which we can investigate for similar benefits.	Zhangzhou Wuzi Trading Co., Ltd.	CN109662236A
Chitosan oligosaccharide composite solid beverage assisting in treatment of type 2 diabetes	Chitosan is a fibre from the exoskeleton in shellfish. Here, the inventors have used extracted oligosaccharides combined with other bioactive including beta-glucan in a beverage for Type II diabetes.	Guangzhou Youlan Marine Biotechnology Co., Ltd. Tianjin University Of Science And Technology	CN110771769A



Title	IPSYNERGY ® INSIGHTS	Owner	Link
Compositions and methods using a combination of curcumin and an omega-3 fatty acid for cellular energy	We haven't seen any press releases from Nestle regarding this innovation. It relates broadly to "cellular energy", and a wide range of health benefits, of which diabetes and other metabolic conditions are named. A study performed in rats supported improved mitochondrial energy production.	Nestle	WO2020094555A1
Anti-diabetic and Anti-obese Fermented Composition Comprising Fermented Hot Pepper and Fermented Hot Pepper Paste	BHN BIO in Korea describe the use of active agents from fermented hot peppers used as active ingredient for treating Type II diabetes and obesity. They have also recently published their research , showing the fermented pepper was more efficacious than the same, non-fermented pepper.	Bhnbio Co Ltd	KR1020200047939A
Novel lactic acid bacteria and method of preparing fermented product having effect of Anti-obesity and Anti-diabetes using the same	This is an interesting approach relevant to NZ. It uses sweet potatoes as a medium to grow a probiotic that has specific effects towards glucose control and type II diabetes. We haven't been able to find details about the company.	Biostream Tech	KR1020200012236A
Adiponectin receptor agonists and uses thereof, and food compositions for activating adiponectin receptor and uses thereof	Japan based Kyoto University's patent describes use of tomato extract, relying on a carotenoid, to target Type II diabetes. This recent research publication gives more details on the science.	Kyoto University Kagome	JP2019189598A
Composition for treating or preventing metabolic disease	Here is another of Amorepacific's patents looking at use of combining catechins and caffeine from green tea extracts for use towards metabolic disease.	Amorepacific Corporation	KR1020190124061A
Açaí berry seed extract, fractions of açai berry seed extracts, process for obtaining açai berry seed extracts, pharmaceutical and food compositions and method for the treatment of diseases or disorders with açai berry seed extract	Unique research from Brazil has led to this patent focused on açai seed extracts with metabolic health outcomes. They provide animal model data demonstrating anti-hypertension effects and positive changes to other metabolic markers. The bioactives stated most likely to be involved include both rutin and catechin, which are both of relevance to research being explored within HVN.	Power Seed Comercio E Representacoes Ltda Uerj Univ Do Estado Do Rio De Janeiro	US20190290715A1

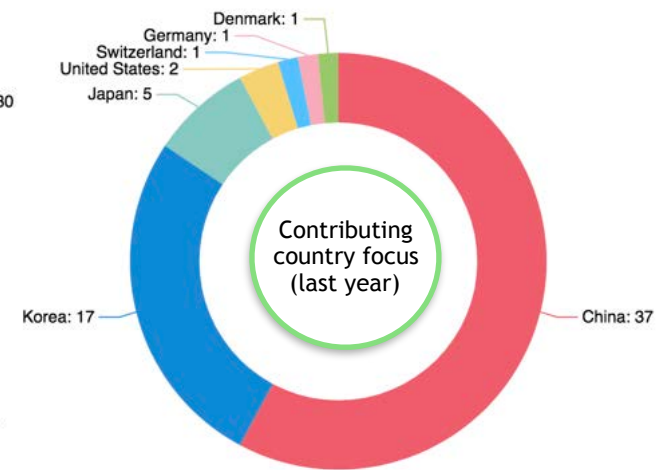
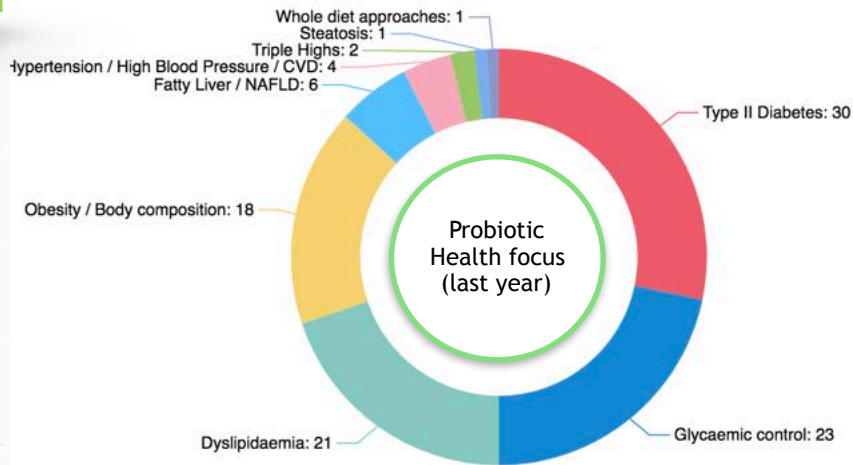


4.CASE STUDIES



4.1. Case Study 1: The Rise of Probiotic Based Approaches to Metabolic Health

PROBIOTICS DASHBOARD



In 2017, University of Otago's [Dr Kristin Wickens](#) research has paved the way for patents filed in about 15 countries (see below map) represented by [WO2018115985](#), and its [associated publication](#). This patent describes the use of Fonterra's *Lactobacillus rhamnosus*

HN001 ([SureStart LactoB 001](#)) for gestational diabetes mellitus. According to [this article](#), Fonterra is exploring how SureStart™ can protect against normal Type II diabetes too. And in this [article](#), Du Pont is said to already be licensing the use of this probiotic. Fonterra's [probiotic research platform has also established benefits towards digestive health and immunity](#). This tells us that NZ has the commercial capability and research expertise to build off this solid base to be a world leader in probiotics to tackle metabolic health.



In the past 12 months, China's Jiangnan University filed a staggering 13 patents ([example](#)) for novel *Lactobacillus* and *Bifidobacterium* strains and their metabolic health uses, nine of which have a diabetes health outcome.

Biostream Technologies's filed a [patent](#) for a novel probiotic and use to make fermented sweet potato. It enhanced probiotic survival and increased polyphenol content, with data shown to improve glucose response.

Larger players including [Mead Johnson](#), [Meg Snow Brand](#) and [Novozymes](#) (having acquired Organobalance) also have new patents leveraging existing or completely novel probiotics to target metabolic health outcomes.

4.2. Case Study 2: Algae as an Emerging Nutrient in the Metabolic Health Space

In this last 12 months, we uncovered three new patents relying solely on algae based approaches to metabolic health through food applications. As profiled here, these patents belong to Japan-based euglena Co, Israel-based Algatech, and China-based Ocean University of China. Although just a small percentage of the patent landscape, we think this targeted approach will see growth in the coming years.

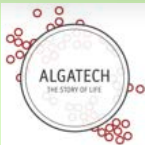
In New Zealand, we have the expertise of [Cawthron Institute, a research partner of HVN, that is in collaboration with Te Rūnanga a o Ngāi Tahu and Wakatū Incorporation to study the potential of karengo](#), a native edible seaweed, for metabolic health outcomes. We look forward to updates!



euglena Co., Ltd. engages in the research, development, production and sale of microalgae products. It operates through the Healthcare; and Energy and Environment segments. The Healthcare segment utilizes euglena to plan and sell in-house products such as food and cosmetics. The Energy and Environment segment deals with funded research and technology development with a focus on microalgae. It also engages in the development of bio fuel production technology and investment in bio-tech related business. The company was founded by Mitsuru Izumo, Kengo Suzuki and Takuyuki Fukumoto on August 9, 2005 and is headquartered in Tokyo, Japan. discovery



[One of euglena's latest patents](#) (out of 71 total patents with a combined value USD8.5M) relates to the use of a mixture of carotenoids from Euglena microalgae for the suppression of blood glucose levels and other metabolic health outcomes. The patent (and also this related [publication](#)) includes mouse studies on a high fat diet showing protective effects of the carotenoids on overall weight, liver weight, blood cholesterol and blood glucose levels compared to suitable controls. The company has a range of products based off Euglena micro algae.



Algatechnologies Ltd. specializes in the commercial cultivation of microalgae. Its products include AstaPure Astaxanthin, AstaPure Arava, AstaPure EyeQ, and FucoVital. The company was founded on November 18, 1998 and is headquartered in Kibbutz Ketura, Israel. discovery



Algatechnologies has sought a [patent](#) to cover its FucoVital™ [launched in 2019](#), with production [tripling later in the year](#). The patent describes that fucoxanthin is the active extract from microalgae with benefits towards liver health, and in particular prevention of fatty liver. [A press release](#) also discusses its positive clinical trial results. [The website](#) describes the importance of this health outcome in the Asian population, and that the product is also effective towards glucose management

Overall, Algatechnologies has a healthy portfolio of 27 patents, balanced between processing methods as well as nutraceutical and food based compositions. [Back in 2018, Algatech invested in NZ based Supreme Biotech](#), acquiring its unique micro algae cultivated in Nelson region, with [Cawthron Institute's expertise](#).



Ocean University of China has a staggering 5000+ patent portfolio valued at USD\$75M. 129 patents refer to the term algae. In one of its latest [patents](#), the university describes the application of oligosaccharides isolated from red algae for diabetes mellitus, obesity, glucose and lipid metabolism impairment and fatty liver, evidenced by mouse models.

5. BULL'S EYE PATENTS

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
A Very Low Glycemic Multigrain Flour	IN201721034818A	2019-12-13	Raj Kumar Bhandari	Glycaemic control	Fibre Flour	Cereals Legumes Baking
Barley sprout tea having increased content of antioxidative or hypoglycemic components	KR1020190124194A	2019-11-04	Republic Of Korea Represented By Rural Devment Administration	Glycaemic control	Tea polyphenols	Cereals Tea
Oat seedling kiwi beverage and preparation method thereof	CN110419653A	2019-11-08	Beijing Univ Of Agri	Glycaemic control	Beta glucan	Kiwifruit Cereals
Flour for foods with low glycemic index	EP3545773A1	2019-10-02	Mengale Andrea	Glycaemic control	Fibre Flour	Cereals Baking
Low-GI puffed rice fruit	CN110236110A	2019-09-17	Henan Jinmilang Food Co., Ltd. Henan Univ Of Animal Husbandry & Economy	Glycaemic control	Anthocyanins Flour	Kumara Misc vegetable / fruit Baking Cereals
Oat rice having hypoglycemic effect and preparation method thereof	CN110200203A	2019-09-06	Zhejiang Yemai Industrial Co., Ltd.	Glycaemic control	Fibre Beta glucan	Cereals Legumes
Hyperglycemia inhibitor	JP2019137631A	2019-08-22	Ace bio product	Glycaemic control	Microbe / probiotic Ginsenoside	Dairy Banana Legumes Ginseng

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Cereal fermented milk with low glycemic index and preparation method thereof	CN110178897A	2019-08-30	Anhui University Of Technology And Science	Glycaemic control	Beta glucan Protein / Peptide / AA	Cereals Legumes Dairy
Comprehensive nutritious powder capable of adjusting metabolism, blood sugar, blood pressure and blood fat and preparation method thereof	CN110169580A	2019-08-27	Chongqing Kangquan Health Management Co., Ltd.	Glycaemic control	Protein / Peptide / AA Oligosaccharide Flour	Dairy Legumes Baking Cereals
Camel whey-assisted hypoglycemic active protein and application thereof in reducing blood sugar	CN110075268A	2019-08-02	Xinjiang University	Glycaemic control	Protein / Peptide / AA	Dairy
Slowly digestible potato steamed bread rich in grape seed proanthocyanidin and making method of steamed bread	CN109965203A	2019-07-05	Zhejiang University	Glycaemic control	Anthocyanins Flour	Kumara Baking Cereals
Passion fruit multi-nutrient drink with blood sugar lowering and blood fat lowering effects, preparation method and application thereof	CN109953242A	2019-07-02	Guilin University Of Technology	Glycaemic control	Protein / Peptide / AA Polysaccharide	Dairy Legumes Misc vegetable / fruit

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Composite flour for bakery products with low glycemic index	RO133116A2	2019-03-29	Univ Stefan Cel Mare Din Suceava	Glycaemic control	Misc Plant Extract Flour	Cereals Baking
Edible Legume Compositions and Methods for Making Same	US20190098907A1	2019-04-04	Hammer Brian Charles	Glycaemic control	Fibre Anthocyanins	Legumes Cereals Baking
Composition as dietary supplement for realizing balanced diet	CN110663961A	2020-01-10	Fantastig	Glycaemic control Dyslipidaemia	Oils / Fats / Lipids	Seafood / Marine Konjac
Slow-digestion potato porridge rich in grape seed proanthocyanidin and preparation method thereof	CN110292159A	2019-10-01	Zhejiang University	Glycaemic control Dyslipidaemia	Fibre Beta glucan Anthocyanins	Cereals Kumara
Pink composite fruity beverage and preparation method thereof	CN109953230A	2019-07-02	Liaoning University	Glycaemic control Dyslipidaemia Hypertension / High Blood Pressure / CVD	Anthocyanins	Kumara
Formula of nutritional bar with low fat, high protein and high dietary fiber as well as preparation method thereof	CN110623278A	2019-12-31	Hangzhou Saineng Pharmaceutical Technology Co., Ltd.	Glycaemic control Obesity / Body composition	Protein / Peptide / AA Oligosaccharide Fibre	Dairy Cereals
Imitated rice and preparation method thereof	CN110037262A	2019-07-23	Hebei North Univ	Glycaemic control Obesity / Body composition	Anthocyanins	Kumara
Special drink for patient with high blood sugar and diabetes	CN110506872A	2019-11-29	Bai Limin	Glycaemic control Type II Diabetes	Tea polyphenols Flour	Misc vegetable / fruit Dairy Baking Cereals Tea

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Composite high-fiber rice capable of lowering blood sugar level and reducing weight and preparation method thereof	CN110447827A	2019-11-15	Anhui Yanzhifang Food	Glycaemic control Type II Diabetes	Fibre Tea polyphenols Flour Pectin	Baking Cereals Tea
A composition for postprandial anti-hyperglycemia comprising ascorbic acid and niacin	KR1020190075702A	2019-07-01	PROTEINWORKS Protein Works Co., Ltd.	Glycaemic control Type II Diabetes	Misc Plant Extract	Feijoa
Low-glycemic-generating-index multi-grain composite flour, food of low-glycemic-generating-index multi-grain composite flour, preparing method of low-glycemic-generating-index multi-grain composite flour and preparing method of food	CN109820137A	2019-05-31	Hebei North Univ	Glycaemic control Type II Diabetes	Flour	Legumes Baking Cereals
Highland barley low-GI extruded noodles and making method thereof	CN109757647A	2019-05-17	Qinghai University	Glycaemic control Type II Diabetes	Fibre Flour	Cereals Baking

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Nutrient powder suitable for being eaten by diabetic patient and preparation method thereof	CN109645124A	2019-04-19	Guangdong Hemei Pharmaceutical Technology Co., Ltd.	Glycaemic control Type II Diabetes Dyslipidaemia	Protein / Peptide / AA Beta glucan	Dairy Cereals Legumes
Low-glycemic-index fiber-rich/high-fibre rice product	CN110122755A	2019-08-16	Yijia Yuanpin Industrial Xiamen Co., Ltd. Tang Chuan Biotechnology (Xiamen) Co., Ltd.	Glycaemic control Type II Diabetes Dyslipidaemia Obesity / Body composition	Fibre Flour	Baking Cereals Konjac
Meal replacement composition for assisting in regulating blood sugar and diet method thereof	CN110720627A	2020-01-24	Shenzhen Huada Agricultural Application Research Institute	Glycaemic control Whole diet approaches	Microbe / probiotic Beta glucan Anthocyanins	Kumara Cereals
Food formula beneficial to weight control and reduction of three highs (high blood pressure, high blood fat and high sugar)	CN109907328A	2019-06-21	Hangzhou Shangyu Yuben Medicine Health Care Technology Development Co., Ltd.	Triple Highs Dyslipidaemia Obesity / Body composition	Protein / Peptide / AA Fibre Beta glucan Oligosaccharide	Cereals Dairy Legumes Konjac
Roasted black highland barley flour and preparation method thereof	CN109527366A	2019-03-29	Aba Plateau Heiqing Barley Natural Biological Development Co., Ltd.	Triple Highs Type II Diabetes Dyslipidaemia	Protein / Peptide / AA Fibre Flour	Cereals Misc vegetable / fruit Baking
Making method of edible plant fiber sausage	CN110613097A	2019-12-27	Langfang Chengtai Energy Food Co., Ltd.	Triple Highs Type II Diabetes Hypertension / High Blood Pressure / CVD Dyslipidaemia	Fibre	N/A Cereals

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Energy nutrient meal capable of relieving symptoms of patients suffering from high blood pressure, high blood sugar and high blood lipid	CN109846032A	2019-06-07	Chen Yikang	Triple Highs Whole diet approaches Glycaemic control	Fibre Beta glucan	Cereals Legumes Misc vegetable / fruit Ginger
Composition for Preventing or Treating Diabetes Comprising Beeswax-Coated Bee Venom Beads As Active Ingredient	KR1020200031811A	2020-03-25	Ahn Chang-gi	Type II Diabetes	N/A	Honey
Composition comprising isomers of inositol and its use	WO2020039014A1	2020-02-27	Soc Des Prod Chims Nestle	Type II Diabetes	N/A	Dairy
Special medicinal food for preventing and improving type 2 diabetics and preparation method and application of special medicinal food	CN110810837A	2020-02-21	Optics Valley Wuhan Institute of Chronic Disease Co., Ltd.	Type II Diabetes	Protein / Peptide / AA Oligosaccharide Anthocyanins	Dairy Kumara Misc vegetable / fruit Konjac
Method for efficiently preparing citrus pectin with relieving of type II diabetes	CN110652013A	2020-01-07	Inst Of Agro Food Sci & Tech Chinese Academy Of Agri Sci	Type II Diabetes	Pectin	Citrus
Ready to eat composition for management of diabetes	IN201811023262A	2019-12-27	Quantum Naturals India Pvt Ltd	Type II Diabetes	Fibre	Baking Cereals Legumes Misc Herbs / Spices

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Use of polar lipids to treat or prevent gestational diabetes mellitus	WO2019244137A1	2019-12-26	Fonterra Coop Group	Type II Diabetes	Oils / Fats / Lipids	Dairy
Application of improving diabetes of lactobacillus paracasei N1115, corresponding milk powder and application thereof	CN110559319A	2019-12-13	Shijiazhuang Junlebao Dairy	Type II Diabetes	Microbe / probiotic	Dairy
Preparation method of fermented pumpkin powder with high probiotic content and low sugar	CN110419700A	2019-11-08	Baodeli Hubei Health Industry Co., Ltd.	Type II Diabetes	Microbe / probiotic	Kumara
Staple food with hypoglycemic effect and preparation method thereof	CN110338346A	2019-10-18	Li Zhonghua Li Juntian	Type II Diabetes	Fibre Anthocyanins Flour Pectin	Kumara Legumes Cereals Baking
Low-GI high-proportion purple sweet potato whole flour noodles and preparation method thereof	CN110313586A	2019-10-11	Sichuan Oriental Staple Food Technology Research Institute	Type II Diabetes	Fibre Anthocyanins Flour	Kumara Cereals Baking Konjac

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Tartary buckwheat flavone dry powder and use of tartary buckwheat flavone dry powder in preparing health care products with auxiliary hypoglycemic function	CN110301640A	2019-10-08	Shanghai Jiaotong Univ School Of Medicine	Type II Diabetes	Fibre	Cereals
Formula and making technology for instant fruit and vegetable compound low-calorie hemp seed meal replacement bars	CN110226707A	2019-09-13	Sichuan Tourism Univ	Type II Diabetes	Flour	Cereals Misc vegetable / fruit Baking
Hypoglycemia rising index high dietary fiber grain compound health nutrition noodle	CN110200208A	2019-09-06	Jilin Agri Sci & Tech College	Type II Diabetes	Fibre	Cereals
Functional food composition for diabetic patients comprising barley and manufacturing method thereof	KR1020190094573A	2019-08-14	Dong Eui Univ Ind Academic Cooperation Found	Type II Diabetes	Flour	Baking Cereals
Composition for Anti-diabetic and manufacturing method thereof	KR1020190094572A	2019-08-14	Dong Eui Univ Ind Academic Cooperation Found	Type II Diabetes	Misc Plant Extract Flour	Baking Cereals
Anti-glycemic composition, and uses thereof	IN201841005074A	2019-08-16	Itc Limited	Type II Diabetes	Ginsenoside	Legumes Ginseng Misc Herbs / Spices

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Preparing method of hullless oat specific healthcare food	CN110101078A	2019-08-09	Gong Yawei	Type II Diabetes	Beta glucan	Cereals
Vanadium binding proteins purified from the sea squirt and functional food composition comprising this	KR101998301B1	2019-07-09	Gangneung Wonju Nat Univ Ind Acad Cooperation Group	Type II Diabetes	Protein / Peptide / AA	Seafood / Marine
Glp-1 secretion-promoting nutritional composition	WO2019139113A1	2019-07-18	Meiji	Type II Diabetes	Protein / Peptide / AA Fibre Oligosaccharide	N/A Dairy
Glucose-control vegetable protein beverage and production method thereof	CN109845829A	2019-06-07	Harbin Univ Of Commerce	Type II Diabetes	Protein / Peptide / AA	Dairy Misc vegetable / fruit
Use of astragalus membranaceus, rubus coreanus and helianthus tuberosus extract mixture for treating diabetes	KR1020190058110A	2019-05-29	Ahn Gook Health	Type II Diabetes	Misc Plant Extract	N/A
Special glucose-lowering formula food for medical use and preparation method thereof	CN109805377A	2019-05-28	Heilongjiang Sunshine Industrial Cannabis Research Institute	Type II Diabetes	Protein / Peptide / AA Fibre Oligosaccharide	Dairy Legumes
Highland barley product and preparation method and application thereof	CN109757652A	2019-05-17	Qinghai University	Type II Diabetes	Fibre	Cereals

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Soymilk beverage containing mogroside and buckwheat, and preparation method thereof	CN109601630A	2019-04-12	Northeast Agricultural University	Type II Diabetes	Protein / Peptide / AA Oligosaccharide Fibre Pectin	Dairy Cereals Legumes
Pure natural sweet potato dietary fiber and preparation method thereof	CN109567182A	2019-04-05	Sichuan Changling Biotech Co Ltd	Type II Diabetes	Fibre Anthocyanins	Kumara
Special hypoglycemic solid beverage for diabetic patients and preparation and use method thereof	CN110810694A	2020-02-21	Wang Yanhui	Type II Diabetes Dyslipidaemia	Beta glucan Oligosaccharide Fibre	Cereals
Tea of whole mountain-cultivated ginseng having increased active ginsenoside, chlorogenic acid and quercetin, and preparation method thereof	KR1020190059525A	2019-05-31	Gyeongnam Nat Univ Of Sci & Tech Ind Academic Cooperation Found	Type II Diabetes Dyslipidaemia	Rutin Tea polyphenols Quercetin Ginsenoside	Tea Ginseng
Food additive rich in selenium, polysaccharide and polysaponin, preparation method and application thereof	CN109662236A	2019-04-23	Zhangzhou Wuzi Trading Co., Ltd.	Type II Diabetes Dyslipidaemia	Saponin Protein / Peptide / AA Polysaccharide Anthocyanins	Misc vegetable / fruit Kumara

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Probiotic JT6 camel milk powder composition having function for regulating lipid metabolism	CN109645123A	2019-04-19	Xinjiang Golden Camel Investment Co., Ltd.	Type II Diabetes Dyslipidaemia Hypertension / High Blood Pressure / CVD	Microbe / probiotic	Dairy
Functional composition containing camellia oil and fish oil and application of functional composition	CN110420270A	2019-11-08	Zhuhai Yibaikang Technology Co., Ltd.	Type II Diabetes Dyslipidaemia Obesity / Body composition Glycaemic control	Oils / Fats / Lipids	Seafood / Marine
Diabetes therapeutic agent containing hydrolyzate of seaweed-derived polysaccharide	JP2019131486A	2019-08-08	OKUNO CHEM IND School Corporation and Foreign School	Type II Diabetes Fatty Liver / NAFLD	Polysaccharide	Seafood / Marine
Application of galactooligosaccharides and derivatives of galactooligosaccharides as SGLT inhibitor	CN110812364A	2020-02-21	Ocean University Of China	Type II Diabetes Fatty Liver / NAFLD Obesity / Body composition	Oligosaccharide Polysaccharide	Seafood / Marine
Agent for suppressing increment of blood glucose level, diabetes preventing agent, and food composition	WO2020045647A1	2020-03-05	Euglena	Type II Diabetes Glycaemic control	Carotenoid	Seafood / Marine

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Application of soluble dietary fibers in kelp in preparation of hypoglycemic drugs and functional foods	CN110787192A	2020-02-14	First Inst Of Oceanography Minist Of Natural Resources	Type II Diabetes Glycaemic control	Fibre	Seafood / Marine
Process and formula of cow milk product containing spinach juice	CN109892392A	2019-06-18	OKUNO CHEM IND School Corporation and Foreign School	Type II Diabetes Hypertension / High Blood Pressure / CVD	Carotenoid	Misc vegetable / fruit Dairy
High protein flour complex with dietary fiber added	CN110179053A	2019-08-30	Yingshang Guanshi Flour Prod	Type II Diabetes Hypertension / High Blood Pressure / CVD Dyslipidaemia	Protein / Peptide / AA Fibre Anthocyanins Flour	Kumara Legumes Baking Cereals
Oat product and preparation method thereof	CN109965208A	2019-07-05	Liu Xiaoli	Type II Diabetes Hypertension / High Blood Pressure / CVD Dyslipidaemia	Beta glucan Fibre Anthocyanins Flour	Kumara Baking Cereals
Anti-diabetic and Anti-obese Fermented Composition Comprising Fermented Hot Pepper and Fermented Hot Pepper Paste	KR1020200047939A	2020-05-08	Bhnbio Co Ltd	Type II Diabetes Obesity / Body composition	Piperine / capsaicin	Pepper
Novel lactic acid bacteria and method of preparing fermented product having effect of Anti-obesity and Anti-diabetes using the same	KR1020200012236A	2020-02-05	Biostream Tech	Type II Diabetes Obesity / Body composition	Microbe / probiotic Anthocyanins	Kumara

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Coix seeds containing slowly digestible starch and preparation method of slowly digestible starch	CN110623200A	2019-12-31	Shanghai Acad Of Agri Sci	Type II Diabetes Obesity / Body composition	N/A	Cereals
High-protein low-energy degreased wheat germ ABLGG yoghurt and preparation method thereof	CN110521773A	2019-12-03	Beijing Union University	Type II Diabetes Obesity / Body composition	Protein / Peptide / AA	Dairy
Adiponectin receptor agonists and uses thereof, and food compositions for activating adiponectin receptor and uses thereof	JP2019189598A	2019-10-31	Kyoto University Kagome	Type II Diabetes Obesity / Body composition	Carotenoid	Misc vegetable / fruit
Instant sweet potato product and preparation method and application thereof	CN110236156A	2019-09-17	Shandong Food & Ferment Ind Res & Design Inst	Type II Diabetes Obesity / Body composition	Anthocyanins	Kumara
Low GI meal replacement powder and preparation method thereof	CN110089762A	2019-08-06	South China Univ Of Tech Zhuhai Modern Industry Innovation Research Institute of South China University of Technology	Type II Diabetes Obesity / Body composition	Protein / Peptide / AA Flour	Baking Cereals
Coarse food grain functional granular rice and preparation method thereof	CN109820144A	2019-05-31	Xi Cunku	Type II Diabetes Obesity / Body composition	Fibre Flour	Baking Cereals

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Hypoglycemic yeast fermented pumpkin powder, preparation method and application	CN109730270A	2019-05-10	Xian Peihua Univ	Type II Diabetes Obesity / Body composition	N/A Anthocyanins	Kumara
Quinoa bran extracts, and extraction method and usage thereof	CN110787197A	2020-02-14	China Acad Of Sci Northwest Highland Biology Inst	Type II Diabetes Obesity / Body composition Hypertension / High Blood Pressure / CVD	Fibre	Cereals
Processing method of steamed whole wheat flour for coordinating hypertension, diabetes and obesity	CN110074322A	2019-08-02	Zhang Dejun	Type II Diabetes Obesity / Body composition Hypertension / High Blood Pressure / CVD	Fibre Flour	Baking Cereals
Functional nutritional breakfast cereal food	CN109998118A	2019-07-12	Lei Wenwen Yi Weixue	Type II Diabetes Obesity / Body composition Stroke	Protein / Peptide / AA Fibre	Cereals
Açaí berry seed extract, fractions of açai berry seed extracts, process for obtaining açai berry seed extracts, pharmaceutical and food compositions and method for the treatment of diseases or disorders with açai berry seed extract	US20190290715A1	2019-09-26	Power Seed Comercio E Representacoes Ltda Uerj Univ Do Estado Do Rio De Janeiro	Type II Diabetes Triple Highs	Rutin Catechin	Berries Misc vegetable / fruit

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Composition for treating obesity with Quercitrin, Spiraeoside or mixture of it	KR102007465B1	2019-08-05	Ind Academic Cooperation Found Hallym Univ	Type II Diabetes Triple Highs Hypertension / High Blood Pressure / CVD Obesity / Body composition	Rutin	N/A

6. HALO PATENTS

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Compositions comprising fucoxanthin and use thereof in reduction of fat accumulation in cells	WO2019193596A1	2019-10-10	Algatech	Fatty Liver / NAFLD	Misc Plant Extract	Seafood / Marine
Composition and method for suppressing increase in blood glucose level	WO2020031952A1	2020-02-13	Suntory	Glycaemic control	Flavanoid	N/A
Oral solid beverage for conditioning intestines and stomach and regulating blood sugar	CN110604245A	2019-12-24	Jinan Taihe Pharmaceutical Technology Co., Ltd.	Glycaemic control	Beta glucan Oligosaccharide Ginsenoside	Misc vegetable / fruit
Carrot and chicory composite nutrient beverage and preparation method thereof	CN110393243A	2019-11-01	Bohai Univ	Glycaemic control	Oligosaccharide	Misc vegetable / fruit
Application of triterpene compound in preparation of related products for reducing blood sugar	CN110368391A	2019-10-25	China Acad Of Sci Northwest Highland Biology Inst	Glycaemic control	Flavanoid	Seabuckthorn
Dietary fiber particles capable of lowering blood sugar and preparation method thereof	CN110200291A	2019-09-06	Jilin Agricultural Univ	Glycaemic control	Beta glucan Fibre	Legumes

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Bread	JP2019103482A	2019-06-27	Kazuyoshi Yagyu	Glycaemic control	Fibre	Baking
Composition containing, as active ingredient, green tea extract with increased polysaccharide content	WO2019098553A2	2019-05-23	Amorepacific Corporation	Glycaemic control	Fibre Catechin Polysaccharide	Tea
Probiotic and prebiotic composition for forming lean body mass and application thereof	CN110151796A	2019-08-23	Zhongke Yikang Beijing Biotechnology Co., Ltd.	Glycaemic control Dyslipidaemia	Microbe / probiotic	N/A
Composition for preventing, ameliorating or treating metabolic diseases comprising Cydonia sinensis leaf extract as effective component	KR1020190083071A	2019-07-11	Korea Res Inst Of Biosci & Biotech	Glycaemic control Fatty Liver / NAFLD	Misc Plant Extract	N/A
White kidney bean and dietary fiber composition and application thereof	CN109770361A	2019-05-21	Hangzhou Saineng Pharmaceutical Technology Co., Ltd.	Glycaemic control Obesity / Body composition	Oligosaccharide Fibre	Legumes
Fermentation product of mung bean hull and uses of the same	TW201918255A	2019-05-16	The Children's Investment Fund Management Tci Co Ltd	Glycaemic control Triple Highs	Misc Plant Extract	Legumes
MCT (medium-chain triglycerides) and coffee compound solid drink	CN109892456A	2019-06-18	Guangzhou Clovi Biotechnology Co., Ltd.	Obesity / Body composition	Oils / Fats / Lipids Caffeine	N/A Citrus Thermogenic foods

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Composition for preventing, treating or improving obesity or obesity-related disease comprising extracts of <i>Lindera obtusiloba</i> Blume leaf	KR1020190100878A	2019-08-29	Kyungpook Nat Univ Ind Academic Cooperation Found	Obesity / Body composition Dyslipidaemia Fatty Liver / NAFLD	Misc Plant Extract	N/A
Compositions and methods for cholesterol, glucose, and microbiome control	WO2019136416A1	2019-07-11	Performance Labs Pte Ltd Gubler Daniel	Triple Highs	Flavonoid Fibre	Berries
Oligo-saccharide enhanced milk products having the functions of modulating blood lipid, improving intestinal flora and promoting immunity, and process for preparing the same	US20190090500A1	2019-03-28	V Prods Corp	Triple Highs Dyslipidaemia	Oligosaccharide	Dairy
Composition for blocking absorption of partial fat and carbohydrate of human body and application	CN109567201A	2019-04-05	Wuxi Haierkai Life Technology Co., Ltd.	Triple Highs Fatty Liver / NAFLD Obesity / Body composition Dyslipidaemia Hypertension / High Blood Pressure / CVD	Tea polyphenols Caffeine Catechin Anthocyanins	Legumes Kumara
Sea cucumber collagen compound preparation suitable for sub-health people	CN110313592A	2019-10-11	Weihai Sailui Aerospace Technology Co., Ltd.	Triple Highs Obesity / Body composition	Protein / Peptide / AA	Seafood / Marine

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Composition for Inhibiting PCSK9 Gene Expression or Increasing Amount of Low Density Lipoprotein Receptor Comprising Butein or Isoeugenol	KR1020190041832A	2019-04-23	Korea Food Res Inst	Triple Highs Type II Diabetes Hypertension / High Blood Pressure / CVD Dyslipidaemia Obesity / Body composition	Misc Plant Extract	N/A
Composition for Anti-Diabetes Using an Extract of Lespedeza cuneata	KR1020200057973A	2020-05-27	Nakdonggang Nat Inst Of Biological Resources	Type II Diabetes	Misc Plant Extract	N/A
Dietary supplement for glycemia control and diabetes prevention	US20200146325A1	2020-05-14	World Pharm Tech Llc	Type II Diabetes	Misc Plant Extract	N/A
Composition for preventing, improving or treating diabetic complications comprising fraction of sesame meal extract or compound isolated from the fraction as effective component	KR1020200043836A	2020-04-28	Ind Academic Cooperation Found Daegu Univ Dongbangfood	Type II Diabetes	Misc Plant Extract	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Pharmaceutical composition comprising the extract of an unripe apple as an effective component for prevention or treatment of diabetes and health functional food comprising the same	KR1020200038700A	2020-04-14	Cheongsong Gun Agri Tech & Extension Cent	Type II Diabetes	Misc Plant Extract	N/A
Pharmaceutical composition comprising the extract of perilla leaf as an effective component for prevention or treatment of diabetes and health functional food comprising the same	KR1020200021707A	2020-03-02	Andong University Industry-Academic Cooperation Foundation	Type II Diabetes	Misc Plant Extract	N/A
Selenium-rich chromium-rich wheat dietary fiber powder and preparation process thereof	CN110839902A	2020-02-28	Tangshan Zhonghong Kangyuan Technology Co., Ltd.	Type II Diabetes	Fibre	Legumes Misc vegetable / fruit
Heptapeptide with alpha-glucosidase inhibitory activity and application of heptapeptide	CN110734471A	2020-01-31	Zhongci Health Products Technology Development Co., Ltd.	Type II Diabetes	Protein / Peptide / AA Tea polyphenols	Tea

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Oligopeptide having dipeptidyl peptidase-4 restraining activity and application of oligopeptide having dipeptidyl peptidase-4 restraining activity	CN110734472A	2020-01-31	Zhongci Health Products Technology Development Co., Ltd.	Type II Diabetes	Protein / Peptide / AA Tea polyphenols	Tea
Oligopeptide with [alpha]-glucosidase inhibitory activity, and application of oligopeptide	CN110734475A	2020-01-31	Zhongci Health Products Technology Development Co., Ltd.	Type II Diabetes	Protein / Peptide / AA Tea polyphenols	Tea
Antidiabetic and antioxidant compositions comprising Flavonoid 8-O-glucuronide compounds	KR1020200008425A	2020-01-28	Univ Ind Cooperation Group Of Kyunghee Univ	Type II Diabetes	Flavanoid	N/A
Compositions for preventing or treating diabetes comprising Benzyl α -D-galactopyranoside or (-)-secoisolariciresinol-9'-O- β -D-glucopyranoside	KR1020200008428A	2020-01-28	Univ Ind Cooperation Group Of Kyunghee Univ	Type II Diabetes	Misc Plant Extract	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Pharmaceutical composition comprising the extract of apis mellifera as an effective component for prevention or treatment of diabetes and health functional food comprising the same	KR1020200009184A	2020-01-30	Andong University Industry-Academic Cooperation Foundation	Type II Diabetes	Misc Plant Extract	N/A
A pharmaceutical composition comprising compounds isolated from the root bark of Morus alba L. for preventing or treating diabetes mellitus	KR102066966B1	2020-01-16	Catholic Univ Of Daegu Ind Academic Cooperation Found	Type II Diabetes	Misc Plant Extract	N/A
Olive oil enriched with oleanolic acid, process for its preparation and use thereof	EP3593651A1	2020-01-15	Csic Consejo Superior De Investigaciones Cientificas Servicio Andaluz De Salud	Type II Diabetes	Oils / Fats / Lipids	Misc vegetable / fruit
A composition for the improving of diabetes comprising Schisandra chinensis and soymilk, and method for preparing the same	KR102061048B1	2019-12-31	Korea Food Res Inst	Type II Diabetes	Misc Plant Extract Fibre	N/A Legumes
Mulberry fruit extract, extraction separation method and application of mulberry fruit extract	CN110615821A	2019-12-27	Northwestern University	Type II Diabetes	Rutin Anthocyanins Quercetin	Misc vegetable / fruit

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Pharmaceutical composition comprising Astragali radix derivatives and Lithospermi radix derivatives for anti-diabetes	KR1020190138456A	2019-12-13	Republic Of Korea Represented By Rural Devment Administration	Type II Diabetes	Misc Plant Extract	N/A
Pharmaceutical composition comprising the extract of teleogryllus emma as an effective component for prevention or treatment of diabetes and health functional food comprising the same	KR102037531B1	2019-10-28	Andong Nat Univ Ind Academic Cooperation Found Andong University Industry-Academic Cooperation Foundation	Type II Diabetes	Misc Plant Extract	N/A
Application of astaxanthin in preparation of glucosidase inhibitor	CN110327316A	2019-10-15	Jimei Univ	Type II Diabetes	Astaxanthin	N/A
Hypoglycemic polypeptide and preparation method and application thereof	CN110317251A	2019-10-11	Shanxi University	Type II Diabetes	Protein / Peptide / AA	Misc vegetable / fruit

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Application of mannuronic acid polysaccharides/ oligosaccharides and derivatives thereof in preparation of medicines used for treating and/or preventing type-2 diabetes	CN110227080A	2019-09-13	Zhejiang University Of Technology	Type II Diabetes	Oligosaccharide Polysaccharide	N/A
Compound brewing powder of grains and mixed beans with low sugar and high fiber as well as preparation method of brewing powder	CN110140866A	2019-08-20	Shanghai Applied Technologies College	Type II Diabetes	Flavanoid Fibre	Legumes
Pharmaceutical composition comprising the ethanol extract of abeliophyllum distichum as an effective component for prevention or treatment of diabetes and health functional food comprising the same	KR1020190088266A	2019-07-26	Andong University Industrial-Academic Cooperation Group Soonchunhyang Univ Ind Acad Cooperation Found	Type II Diabetes	Misc Plant Extract	N/A
Application of AE (8-C-Asorbyl(-)-Epigallocatechin) as medicinal foods and relevant preparations for treating and improving diabetes	CN110038004A	2019-07-23	Tianjin University Of Science And Technology	Type II Diabetes	Catechin	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Pharmaceutical composition comprising the seed extracts of rambutan as an effective component for prevention or treatment of diabetes and health functional food comprising the same	KR1020190066460A	2019-06-13	Soojin Pyo Sunghwajeong	Type II Diabetes	Misc Plant Extract	N/A Misc vegetable / fruit
Pharmaceutical composition comprising the sprout extracts of zingiber officinale as an effective component for prevention or treatment of diabetes and health functional food comprising the same	KR1020190066496A	2019-06-13	Andong University Industry-Academic Cooperation Foundation	Type II Diabetes	Misc Plant Extract	Ginger
Composition for prevention, improvement or treatment of diabetes with extracts from Gynura procumbens leaf, Cornus officinalis and Pyrus ussuriensis	KR101976710B1	2019-05-09	Knu Ind Cooperation Found	Type II Diabetes	Misc Plant Extract	N/A
The use of jerusalem thorn fruits as herbal tea for diabetes treatment	WO2019088958A2	2019-05-09	Takim Kasim	Type II Diabetes	Misc Plant Extract Tea polyphenols	Tea

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Blood-glucose-reducing functional food	CN109602013A	2019-04-12	Tesu Biotechnology Tianjin Co., Ltd.	Type II Diabetes	Tea polyphenols Fibre	Tea
Skin cell activator, Pharmaceutical composition for preventing and treating diabetes or non-alcoholic fatty liver	KR1020190097509A	2019-08-21	Green Plus	Type II Diabetes Fatty Liver / NAFLD	Misc Plant Extract	N/A
Composition for preventing, treating or improving obesity or obesity-related disease comprising extracts of <i>Mentha arvensis</i> var. <i>piperascens</i>	KR1020190100879A	2019-08-29	Kyungpook Nat Univ Ind Academic Cooperation Found	Type II Diabetes Fatty Liver / NAFLD Dyslipidaemia Obesity / Body composition Glycaemic control	Misc Plant Extract	N/A
Application of broadleaf holly leaf aqueous extract and drug composition for regulating intestinal microecology	CN110742915A	2020-02-04	Hubei Univ Of Chinese Medicine	Type II Diabetes Fatty Liver / NAFLD Obesity / Body composition	Misc Plant Extract	N/A
A <i>Bacillus</i> probiotics mixture for preventing or treating obesity, diabetes and fatty liver and uses thereof	KR1020190067527A	2019-06-17	Pohang Technopark Found	Type II Diabetes Fatty Liver / NAFLD Obesity / Body composition	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
A composition for preventing or improving obesity or obesity-related disease comprising gentiopicroside	KR1020190087149A	2019-07-24	Ind Academic Cooperation Found Of Sunchon Nat Univ	Type II Diabetes Fatty Liver / NAFLD Obesity / Body composition Dyslipidaemia Hypertension / High Blood Pressure / CVD	Misc Plant Extract	N/A
Composition for preventing, treating or improving obesity or obesity-related disease comprising extracts of Angelica tenuissima	KR1020190100880A	2019-08-29	Kyungpook Nat Univ Ind Academic Cooperation Found	Type II Diabetes Fatty Liver / NAFLD Obesity / Body composition Glycaemic control	Misc Plant Extract	N/A
Composition for preventing or treating prediabetes or diabetes comprising fractionation of Gentiana scabra extracts	KR1020200056365A	2020-05-22	Univ Ind Cooperation Group Of Kyunghee Univ	Type II Diabetes Glycaemic control	Misc Plant Extract	N/A
Chitosan oligosaccharide composite solid beverage assisting in treatment of type 2 diabetes	CN110771769A	2020-02-11	Guangzhou Youlan Marine Biotechnology Co., Ltd. Tianjin University Of Science And Technology	Type II Diabetes Glycaemic control	Beta glucan Oligosaccharide	Legumes

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Composition comprising extract of <i>Gymnema sylvestre</i> or compound isolated from thereof for preventing or treating of diabetes mellitus	KR1020190132314A	2019-11-27	Seoul Nat Univ Res & Dev Business Found Snu R& Db Found Namdeok Joint Stock Company	Type II Diabetes Glycaemic control	Misc Plant Extract	N/A
Composition containing soybean Aglycin-family peptides and application thereof	CN110327456A	2019-10-15	China Food Duqing (Shandong) Biotechnology Co., Ltd. Shandong Tianjiu Biotechnology Co., Ltd.	Type II Diabetes Glycaemic control	Polysaccharide	Legumes
Composition comprising extract of <i>Gymnema sylvestre</i> or compound isolated from thereof for preventing or treating of diabetes mellitus	KR1020190093849A	2019-08-12	Seoul Nat Univ Res & Dev Business Found Snu R& Db Found Namdeok Joint Stock Company	Type II Diabetes Glycaemic control	Misc Plant Extract	N/A
Composition for preventing or treating diabetes comprising goyaglycoside G isolated from <i>Mormodica charantia</i> extract as an active ingredient	KR101991899B1	2019-06-21	Pharvis Korea Pharm	Type II Diabetes Glycaemic control	Misc Plant Extract	N/A
Composition for preventing or treating diabetes mellitus comprising <i>Rorippa globosa</i> extracts	KR101989739B1	2019-06-14	Univ Ind Cooperation Group Of Kyunghee Univ	Type II Diabetes Glycaemic control	Misc Plant Extract	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Blueberry-nettle tea capable of controlling blood sugar and preparation method of such blueberry-nettle tea	CN109907144A	2019-06-21	Shaanxi University Of Science & Technology	Type II Diabetes Glycaemic control	Anthocyanins Tea polyphenols	Tea
Compositions and methods using a combination of curcumin and an omega-3 fatty acid for cellular energy	WO2020094555A1	2020-05-14	Soc Des Prod Chims Nestle	Type II Diabetes Obesity / Body composition	Oils / Fats / Lipids	Turmeric Thermogenic foods
Manufacturing method of composition having anti-obesity and anti-diabetic activity using stem and leaf of Codonopsis lanceolata	KR1020190102834A	2019-09-04	Konyang Univ Indal Cooperation Group	Type II Diabetes Obesity / Body composition	Misc Plant Extract	N/A
Enzyme composition for regulating sugar metabolism	WO2019093663A1	2019-05-16	Hwang Ji Hwan Ind Academic Coop Ind Academic Cooperation Found Yonsei Univ	Type II Diabetes Obesity / Body composition	Enzyme	N/A
Composition for treating or preventing metabolic disease	KR1020190124061A	2019-11-04	Amorepacific Corporation	Type II Diabetes Obesity / Body composition Dyslipidaemia Hypertension / High Blood Pressure / CVD	Caffeine Catechin	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Application of common fenugreek seed extract and extraction method thereof	CN110559335A	2019-12-13	Qinghai University	Type II Diabetes Obesity / Body composition Glycaemic control	Misc Plant Extract	N/A
Method and system for treating or preventing type ii diabetes and/or reducing inflammation and body weight/waist circumference	US20200008459A1	2020-01-09	Angelo Jr Patrick	Type II Diabetes Whole diet approaches Obesity / Body composition	N/A	N/A Misc vegetable / fruit

7. BACKGROUND PATENTS

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Food composition for reducing triglyceride containing green tea catechins, food composition for improving metabolic diseases and pharmaceutical composition for preventing or treating metabolic diseases	KR1020200046418A	2020-05-07	Ind Found Of Chonnam Nat Univ	Dyslipidaemia	Tea polyphenols	Tea Misc Herbs / Spices
Yak milk powder formula for old people and preparation method of yak milk powder formula	CN110558388A	2019-12-13	Henan Ruishan Dairy Co., Ltd.	Dyslipidaemia	Protein / Peptide / AA Oligosaccharide Fibre	Dairy
Low-caloric dietary fiber rice and making method thereof	CN110495613A	2019-11-26	He Xingchun	Dyslipidaemia	Fibre	Konjac
Cactus solid beverage and preparation method	CN110495542A	2019-11-26	Jiangmen Polytechnic	Dyslipidaemia	Misc Plant Extract	N/A
Fat-enriched protein in euphausia superba, and application and separating and detecting method of fat-enriched protein	CN110407923A	2019-11-05	Shandong Normal Univ.	Dyslipidaemia	Protein / Peptide / AA	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Preparation method of potato yoghurt through fermentation with probiotics, for reducing cholesterol	CN110403015A	2019-11-05	Guizhou Univ	Dyslipidaemia	Microbe / probiotic Anthocyanins	Kumara Dairy
Preparation method and application of asparagus polysaccharide oligomer	CN110368400A	2019-10-25	Dalian Polytechnic University	Dyslipidaemia	Polysaccharide	Misc vegetable / fruit
Bifidobacterium pseudocatenulatum CCFM1047, composition, fermented food, application and bacterial agent of bifidobacterium pseudocatenulatum CCFM1047 and preparation method of bacterial agent of bifidobacterium pseudocatenulatum CCFM1047	CN110106103A	2019-08-09	Jiangnan University	Dyslipidaemia	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Bifidobacterium pseudocatenulatum CCFM1048, composition, fermented food, application and bacterial agent of bifidobacterium pseudocatenulatum CCFM1048 and preparation method of bacterial agent of bifidobacterium pseudocatenulatum CCFM1048	CN110106104A	2019-08-09	Jiangnan University	Dyslipidaemia	Microbe / probiotic	N/A
Bifidobacterium pseudocatenulatum CCFM1045, composition, fermented food, applications, microbial inoculum and preparation method thereof	CN110093287A	2019-08-06	Jiangnan University	Dyslipidaemia	Microbe / probiotic	N/A
Bifidobacterium pseudocatenulatum CCFM1046, composition, fermented food, applications, microbial inoculum and preparation method thereof	CN110093286A	2019-08-06	Jiangnan University	Dyslipidaemia	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Asparagus extract as well as preparation method and application thereof	CN110075229A	2019-08-02	Qinhuangdao Changsheng Nutrition And Health Technology Co., Ltd. Nanjing Medical University	Dyslipidaemia	Saponin	Misc vegetable / fruit
Plant lactic acid bacteria having function of reducing cholesterol, and application and microecological preparation of plant lactic acid bacteria	CN109971668A	2019-07-05	Inst Of Special Animal & Plant Sci Of Caas	Dyslipidaemia	Microbe / probiotic	N/A
Jasmine polysaccharide lozenges and preparation method thereof	CN109939076A	2019-06-28	Crop Res Inst Of Fujian Acad Of Agri Sci	Dyslipidaemia	Polysaccharide	N/A
Complex probiotic and application thereof	CN109628358A	2019-04-16	Infinitus China	Dyslipidaemia	Microbe / probiotic	N/A
Application of lactobacillus rhamnosus CCFM1060 in preparation of functional microbial agents, foods and/or medicines	CN110638843A	2020-01-03	Jiangnan University	Dyslipidaemia Glycaemic control	Microbe / probiotic	N/A
Linseed bean powder full-nutrient meal and preparation method thereof	CN110214893A	2019-09-10	Guangxi Nanning Kangzhidou Food Tech	Dyslipidaemia Hypertension / High Blood Pressure / CVD	Protein / Peptide / AA Flour	Legumes Baking Cereals

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
A Composition Comprising Extract of Red Ginseng for Preventing or Improving Metabolic Diseases	KR1020190076927A	2019-07-02	Jinan Hongsam Res Inst	Dyslipidaemia Hypertension / High Blood Pressure / CVD	Ginsenoside	Ginseng
Stevia-ginger tea and preparation method thereof	CN109845860A	2019-06-07	Shandong Leibniz Industrial Co., Ltd.	Dyslipidaemia Hypertension / High Blood Pressure / CVD	Tea polyphenols	Ginger Tea
Composition for preventing or treating metabolic disease comprising Artemisiae capillaris herba and Citrus unshiu peel complex extract as an active ingredient	KR102001557B1	2019-07-17	Medicare Pharmaceutical Co., Ltd.	Dyslipidaemia Obesity / Body composition	Misc Plant Extract	N/A Citrus
Composition containing tea extract with increased specific ingredient content for prevention or alleviation of lipid metabolism disorders	WO2019088412A1	2019-05-09	Amorepacific Corporation	Dyslipidaemia Obesity / Body composition	Tea polyphenols	N/A Tea
Composition comprising lactococcus chungangensis for prevention or treatment of fatty liver or metabolic syndrome	WO2020080884A1	2020-04-23	Chung Ang Univ Ind Academic Cooperation Found	Fatty Liver / NAFLD	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Compositions for Preventing, Improving or Treating Non-Alcoholic Fatty Liver Disease Comprising Combined Extracts of Peach Blossom and Water Chestnut	KR1020190135961A	2019-12-09	Univ Ind Cooperation Group Of Kyunghee Univ Neumed	Fatty Liver / NAFLD Obesity / Body composition	Misc Plant Extract	N/A
Probiotic supplement for metabolic health comprising lactobacillus	WO2020084051A1	2020-04-30	Novozymes Organobalance	Glycaemic control	Microbe / probiotic	N/A
Postprandial hyperglycemia inhibitory composition and method for producing the same	JP2020007284A	2020-01-16	Megmilk Snow Brand	Glycaemic control	Microbe / probiotic	N/A
Probiotic composition for improving hyperglycemia	CN110638842A	2020-01-03	Shanghai Lilong Biological Technology Co., Ltd.	Glycaemic control	Microbe / probiotic	N/A
High-fiber combination noodle product with low glycemic index	TWM588439U	2020-01-01	Hong Kong Shangtangxin Biotechnology Co., Ltd. THOMSON MOST BIOTECH LTD TAIWAN BRANCH	Glycaemic control	Fibre	Konjac
Rice product with low glycemic index	TWM588440U	2020-01-01	Hong Kong Shangtangxin Biotechnology Co., Ltd. Thomson Most Biotech Ltd Taiwan Branch	Glycaemic control	Fibre	Konjac

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
High blood pressure, blood sugar and blood lipid-lowering nutritional combination functional food and preparation method thereof	CN110558568A	2019-12-13	Shaanxi Zhonghong Kerui Regenerative Medicine Research Institute Co., Ltd.	Glycaemic control	Protein / Peptide / AA Oligosaccharide	Legumes
Hyperglycemia inhibitor	JP2019199451A	2019-11-21	Hirosaki University Asunaro Riken Corporation	Glycaemic control	Microbe / probiotic	N/A
Human-derived probiotic agent and application thereof in assisting in reducing blood sugar	CN110522035A	2019-12-03	China-Canada Institute of Health Engineering Hefei Co., Ltd.	Glycaemic control	Oligosaccharide Microbe / probiotic	N/A
Nutritional composition	WO2019223818A1	2019-11-28	Kratochvil Roman	Glycaemic control	Oils / Fats / Lipids	Misc vegetable / fruit
Composition for prevention and improvement of abnormal saccharometabolism	JP2019187264A	2019-10-31	Kirin Company	Glycaemic control	Microbe / probiotic	N/A
Composition for preventing or treating metabolic syndrome comprising extracts of Viburnum stellatomentosum (Oerst.) Hemsl., a fraction thereof	KR101994557B1	2019-06-28	Korea Res Inst Of Biosci & Biotech	Glycaemic control Dyslipidaemia	Misc Plant Extract	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Probiotic health drink capable of assisting in controlling hypertension, hyperglycemia, hyperlipidemia and hyperuric acid	CN110692884A	2020-01-17	Shanghai Yingku Business Consulting Co., Ltd.	Glycaemic control Dyslipidaemia Hypertension / High Blood Pressure / CVD	Microbe / probiotic	N/A
Extracts of moricandia for the use thereof in the prevention and treatment of metabolic diseases	WO2020053519A1	2020-03-19	Univ De Bourgogne Cnrs Institut National De La Recherche Agronomique Univ De Monastir	Glycaemic control Obesity / Body composition	Misc Plant Extract	N/A
Instant quinoa collagen thick soup composition that only needs to be brewed and a preparation method thereof	CN110558552A	2019-12-13	Futai Zhenji Shenzhen Biotechnology Co., Ltd	Glycaemic control Obesity / Body composition	Protein / Peptide / AA Beta glucan	Legumes
Rice cake and bread and manufacturing method of the same that	KR1020190039368A	2019-04-11	Han Sang-gap	Glycaemic control Obesity / Body composition	Fibre	Baking
Lactobacillus having blood glucose lowering effect and antioxidant effect	KR102063772B1	2020-01-08	Medigen Co., Ltd. Namsoo Baek	Glycaemic control Type II Diabetes	Microbe / probiotic	N/A
Food for improving blood sugar and application of food	CN110638041A	2020-01-03	Wei Yiquan Guo Xuefeng	Glycaemic control Type II Diabetes	Misc Plant Extract	N/A
Functional food of probiotic preparation with effect of lowering blood sugar	CN109998113A	2019-07-12	Guangdong Inst Of Microbiology Guangdong Detection Cent Of Microbiology	Glycaemic control Type II Diabetes Obesity / Body composition	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Green turtle health care solid beverage and preparation method thereof	CN110651944A	2020-01-07	Mo Changgen	Hypertension / High Blood Pressure / CVD	Oligosaccharide	N/A
Plant protein solid beverage for enhancing immunity and preparation method of beverage	CN110250277A	2019-09-20	Yu Xueping	Hypertension / High Blood Pressure / CVD	Protein / Peptide / AA	Legumes
Soya-bean milk for preventing three highs and making method thereof	CN110250275A	2019-09-20	Heilongjiang Beidahuang Green Health Food	Hypertension / High Blood Pressure / CVD	Rutin Quercetin	Legumes
Composition containing probiotics and preparation method thereof	CN109771470A	2019-05-21	Moen Guangzhou Biotechnology Co., Ltd.	Hypertension / High Blood Pressure / CVD	Microbe / probiotic	Legumes
Lactobacillus rhamnosus CCFM1060, fermented food and preparation method of bacterial agent	CN110468070A	2019-11-19	Jiangnan University	Hypertension / High Blood Pressure / CVD Dyslipidaemia Fatty Liver / NAFLD Glycaemic control	Microbe / probiotic	N/A
Akkermansia muciniphila strain and use thereof	WO2020076136A2	2020-04-16	Seoul Nat Univ Res & Dev Business Found Snu R&D Found Ko Biolabs Inc	Obesity / Body composition	Protein / Peptide / AA Microbe / probiotic	N/A
Pharmaceutical composition comprising extract of fermented ginger for prevention or treatment of metabolic disease	KR1020200032007A	2020-03-25	Univ Ind Cooperation Group Of Kyunghee Univ	Obesity / Body composition	Misc Plant Extract	Ginger

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Green tea flower formulation for weight management	US20200093881A1	2020-03-26	Prasad Kodimule Shyam	Obesity / Body composition	Caffeine Protein / Peptide / AA Tea polyphenols	Tea
Method of using a rosemary extract composition for weight management	US20200085900A1	2020-03-19	Vidya Herbs Inc	Obesity / Body composition	Caffeine Protein / Peptide / AA	N/A
Composition for preventing and treating of obesity or metabolic disease comprising <i>Elaeagnus umbellata</i> extracts	KR1020200002260A	2020-01-08	Inje Univ Ind Academic Cooperation Found	Obesity / Body composition	Misc Plant Extract	N/A
Novel lactobacillus paracasei gks6 for mitigating metabolic syndrome, culture medium thereof, culture method, use, pharmaceutical composition, and edible composition	WO2020006663A1	2020-01-09	Grape King	Obesity / Body composition	Microbe / probiotic	N/A
Composition for preventing and treating of obesity or metabolic disease comprising essential oils extracted from <i>Cnidii Rhizoma</i>	KR1020190140161A	2019-12-19	Ind Academic Cooperation Found Daegu Haany Univ	Obesity / Body composition	Misc Plant Extract	N/A
High-protein defatted germ flavored fermented milk and preparation method thereof	CN110521774A	2019-12-03	Beijing Union University	Obesity / Body composition	Protein / Peptide / AA	Dairy

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Novel bacteroides vulgatus strain and composition, for preventing, relieving or treating immune and metabolic diseases, having same as active ingredient	WO2019203625A1	2019-10-24	Seoul Nat Univ Res & Dev Business Found Snu R& Db Found Ko Biolabs Inc	Obesity / Body composition	Microbe / probiotic	N/A
Obesity treatment using probiotics, composition for reducing body fat, and composition for reducing waist circumference	WO2019189408A1	2019-10-03	Morinaga Milk Industry	Obesity / Body composition	Microbe / probiotic	N/A
Composition, comprising natural combined extract, for prevention or treatment of obesity	WO2019182227A1	2019-09-26	Korea Inst Of Oriental Medicine	Obesity / Body composition	Misc Plant Extract	N/A
Lactobacillus plantarum K10 having anti-obesity effect and uses thereof	KR1020190090407A	2019-08-02	Chongkundang Bio Korea Food Res Inst Handong Global Univercity Ind Academic Cooperation Found	Obesity / Body composition	Microbe / probiotic	N/A
Lactobacillus plantarum KC3 having anti-obesity effect and uses thereof	KR102011883B1	2019-08-20	Chongkundang Bio Korea Food Res Inst Handong Global Univercity Ind Academic Cooperation Found	Obesity / Body composition	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Lactobacillus plantarum K50 having anti-obesity effect and uses thereof	KR1020190090408A	2019-08-02	Chongkundang Bio Korea Food Res Inst Handong Global Univercity Ind Academic Cooperation Found	Obesity / Body composition	Microbe / probiotic	N/A
Nutritional Supplements Containing A Peptide Component And Uses Thereof	US20190224273A1	2019-07-25	Mead Johnson Nutrition	Obesity / Body composition	Protein / Peptide / AA Microbe / probiotic	N/A
A composition for improving, preventing and treating obesity comprising fermented pollack skin	KR1020190084732A	2019-07-17	Jongpil Kim	Obesity / Body composition	N/A	Seafood / Marine
Lactic acid bacteria drink free of milk and additives and preparation method thereof	CN110037214A	2019-07-23	Qingdao Ruisee Biotechnology Co., Ltd.	Obesity / Body composition	Protein / Peptide / AA Oligosaccharide	Dairy
Lactobacillus plantarum K259 having anti-obesity effect and uses thereof	KR1020190077715A	2019-07-04	Chongkundang Bio Handong Global Univercity Ind Academic Cooperation Found Korea Food Res Inst	Obesity / Body composition	Microbe / probiotic	N/A
Lactobacillus plantarum KC28 having anti-obesity effect and uses thereof	KR1020190077714A	2019-07-04	Chongkundang Bio Handong Global Univercity Ind Academic Cooperation Found Korea Food Res Inst	Obesity / Body composition	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Compositions for Preventing, Improving or Treating Obesity and Metabolic Diseases Comprising Combined Extracts of Peach Blossom and Lotus Leaf	KR1020190049409A	2019-05-09	Univ Ind Cooperation Group Of Kyunghee Univ Neumed	Obesity / Body composition	Misc Plant Extract	N/A
Composition for Preventing or Treating Obesity Comprising Exopolysaccharides from Kefir Grains	KR1020190047293A	2019-05-08	Ind Univ Cooperation Found Hanyang Univ Konkuk Univ Indal Cooperation	Obesity / Body composition	N/A	Dairy
Compositions for Preventing, Improving or Treating Obesity and Metabolic Diseases Comprising Combined Extracts of Peach Blossom and Water Chestnut	KR1020190049410A	2019-05-09	Univ Ind Cooperation Group Of Kyunghee Univ Neumed	Obesity / Body composition	Misc Plant Extract	N/A
Composition for preventing, ameliorating or treating metabolic diseases comprising mixture of plant extract as effective component	KR1020200045036A	2020-05-04	Ato Q&A	Obesity / Body composition Dyslipidaemia	Misc Plant Extract	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Composition comprising water soluble β -Glucan from oat on calorie restriction effect	KR1020190050234A	2019-05-10	Eugene Biotech Co., Ltd.	Obesity / Body composition Dyslipidaemia	Misc Plant Extract Beta glucan	Cereals
Composition comprising fat reduction aid andbetaglucan as an effective ingredient for preventing or treating of obesity	KR1020190032182A	2019-03-27	Guegen Biotech	Obesity / Body composition Dyslipidaemia	Beta glucan	Cereals
Bifidobacterium longum YH295 and application thereof in preparation of product for reducing abdominal obesity risk	CN109593678A	2019-04-09	Jiaxing Yinuokang Biological Technology Co., Ltd. Haibiyou Group Company	Obesity / Body composition Fatty Liver / NAFLD	Microbe / probiotic Protein / Peptide / AA	N/A
Compositions for the prevention or treatment of metabolic diseases containing extracts or fractions of Typha angustifolia	KR1020200049132A	2020-05-08	Jeju University Industry-Academic Cooperation Foundation	Triple Highs	Misc Plant Extract	N/A
Composition comprising selaginella rossii warb. extract or fractions thereof for preventing or treating metabolic syndromes	WO2019124803A1	2019-06-27	Korea Res Inst Of Biosci & Biotech	Triple Highs Dyslipidaemia	Misc Plant Extract	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Beverage containing chlorella, turmeric and natural inulin and preparation method of beverage	CN110115330A	2019-08-13	American Langzhi Biotechnology Group	Triple Highs Dyslipidaemia Hypertension / High Blood Pressure / CVD	Oligosaccharide Curcumin	N/A Turmeric
Probiotic, fruit and vegetable ferment and corn peptide composite diet for improving immunity and reducing high blood pressure, high blood lipid and high blood sugar	CN110179120A	2019-08-30	Yang Han	Triple Highs Glycaemic control	Protein / Peptide / AA Microbe / probiotic Oligosaccharide	Misc vegetable / fruit
Composition capable of reducing blood fat, blood pressure and blood sugar and preparation method thereof	CN109757730A	2019-05-17	Shandong Huanyi Biotechnology Co., Ltd.	Triple Highs Glycaemic control	Microbe / probiotic	N/A
Protein-based (solid) nutritional powder composed of protein	CN110250523A	2019-09-20	Wan Jinrong	Triple Highs Hypertension / High Blood Pressure / CVD Dyslipidaemia	Rutin Protein / Peptide / AA Fibre Flour	Cereals Baking
Faecalibacterium longum and application thereof	HK40000520A	2020-02-07	-	Type II Diabetes	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Pharmaceutical composition for preventing or treating diabetes comprising as an active ingredient a compound isolated from <i>Bacillus amyloliquefaciens</i> RWL-1 culture medium	KR102085900B1	2020-03-06	Kyungpook Nat Univ Ind Academic Cooperation Found	Type II Diabetes	Microbe / probiotic	N/A
Multifunctional lactobacillus casei CCFM1052 for relieving PFOA toxic effect, and fermented food and application of multifunctional lactobacillus casei CCFM1052	CN110684682A	2020-01-14	Jiangnan University	Type II Diabetes	Microbe / probiotic	N/A
Diabetes-alleviating or antioxidant composition comprising yeast extract and method for preparing yeast extract	WO2020004858A1	2020-01-02	Coenbio	Type II Diabetes	Microbe / probiotic	N/A
Preparation method of N1115 probiotic powder suitable for diabetics to eat and application of corresponding probiotic powder	CN110604294A	2019-12-24	Shijiazhuang Junlebao Dairy	Type II Diabetes	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Probiotic fermentation beverage capable of preventing and controlling diabetes mellitus, and preparation method thereof	CN110558463A	2019-12-13	Harbin Fermentation Biotechnology Co., Ltd.	Type II Diabetes	Microbe / probiotic	Misc vegetable / fruit
Probiotic composition suitable for being eaten by diabetic patients and application thereof	CN110150669A	2019-08-23	Hebei Yiran Biotechnology Co., Ltd.	Type II Diabetes	Microbe / probiotic	N/A
Application of quercetin to inhibition of tyrosine phosphatase 1B	CN110025611A	2019-07-19	Jilin University	Type II Diabetes	Protein / Peptide / AA Rutin Quercetin	N/A
Leuconostoc mesenteroides MKSR, a health functional food and food additive for preventing or improving diabetes comprising the same	KR101977255B1	2019-05-10	Dankook Univ Cheonan Campus Ind Academic Cooperation Found	Type II Diabetes	Microbe / probiotic	N/A
Probiotics dietary replenisher with function of alleviating type II diabetes, and application thereof	CN109674060A	2019-04-26	Suzhou Weike Life Technology Co., Ltd.	Type II Diabetes	Microbe / probiotic Polysaccharide	N/A
Application of lactobacillus plantarum CQPC02 in preparing foods or drugs for preventing diabetes	CN109645490A	2019-04-19	Chongqing Univ Of Education	Type II Diabetes	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Use of histidine, glycine and other aminoacids for preventing insulin resistance and/or diabetes	WO2020064692A1	2020-04-02	Soc Des Prod Chims Nestle	Type II Diabetes Dyslipidaemia	Protein / Peptide / AA	N/A
Taste good biscuits for diabetics	IN201841021441A	2019-12-13	Azista Ind Pvt Ltd	Type II Diabetes Dyslipidaemia	Fibre	Baking
Food for regulating lipid metabolism of diabetes patients and preparation method and application of food	CN110122853A	2019-08-16	Linyi University	Type II Diabetes Dyslipidaemia	Fibre	N/A
Probiotic composition and application thereof	CN109666615A	2019-04-23	Infinitus China	Type II Diabetes Dyslipidaemia	Microbe / probiotic	N/A
Bifidobacterium adolescentis CCFM1061, fermented food thereof and preparation method of microbial agent	CN110331118A	2019-10-15	Jiangnan University	Type II Diabetes Dyslipidaemia Fatty Liver / NAFLD	Protein / Peptide / AA Microbe / probiotic	N/A
Bifidobacterium adolescentis CCFM1062, bifidobacterium adolescentis CCFM1062 fermented food and preparation method of bifidobacterium adolescentis CCFM1062 agent	CN110432332A	2019-11-12	Jiangnan University	Type II Diabetes Dyslipidaemia Glycaemic control	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Application of bifidobacterium adolescentis CCFM1061 in preparation of functional microbial agents, foods and/or medicines	CN110354148A	2019-10-22	Jiangnan University	Type II Diabetes Dyslipidaemia Glycaemic control	Microbe / probiotic	N/A
Bifidobacterium bifidum CCFM1063 and application thereof	CN110331119A	2019-10-15	Jiangnan University	Type II Diabetes Dyslipidaemia Glycaemic control	Microbe / probiotic	N/A
Lactobacillus rhamnosus CCFM1064 and application thereof	CN110305820A	2019-10-08	Jiangnan University	Type II Diabetes Dyslipidaemia Glycaemic control	Microbe / probiotic	N/A
Lactobacillus fermentum LM1016 and composition for preventing and treating cardiovascular diseases comprising the same	KR101980527B1	2019-05-21	Genome & Company, Inc. LACTOMASON CO LTD	Type II Diabetes Fatty Liver / NAFLD Obesity / Body composition	Microbe / probiotic	N/A
Application of bifidobacterium adolescentis CCFM1062 in preparation of functional bacterial agents, foods and/or medicines	CN110368406A	2019-10-25	Jiangnan University	Type II Diabetes Glycaemic control Dyslipidaemia Steatosis	Microbe / probiotic	N/A
Cyperus esculentus chewable tablets and production method thereof	CN110250477A	2019-09-20	Song Yulai	Type II Diabetes Hypertension / High Blood Pressure / CVD	Protein / Peptide / AA	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Compound multi-enzyme food containing active earthworm protein and nattokinase and preparation method thereof	CN110089758A	2019-08-06	Zhu Guoqiang	Type II Diabetes Hypertension / High Blood Pressure / CVD	Enzyme Fibre Tea polyphenols	Legumes Tea
Wet grosvenor momordica fruit rice noodle rich in microelement selenium and preparation method of rice noodle.	CN110301584A	2019-10-08	Guilin Laoyan Street Catering Co., Ltd.	Type II Diabetes Hypertension / High Blood Pressure / CVD Obesity / Body composition Dyslipidaemia	Misc Plant Extract	Misc vegetable / fruit
Food composition of Synurus deltoides extract for improving obesity and preventing diabetes	KR1020190115617A	2019-10-14	Gyeongsangbuk Do Provinceforest Resources Dev Inst Of Gyeongsangbuk Do	Type II Diabetes Obesity / Body composition	Misc Plant Extract	N/A
Rice cake manufacturing method of the same that	KR1020190075888A	2019-07-01	Han Sang-gap	Type II Diabetes Obesity / Body composition	N/A	Baking
Microbial compositions and methods for treating type 2 diabetes, obesity, and metabolic syndrome	WO2019118984A2	2019-06-20	Solarea Bio Inc	Type II Diabetes Obesity / Body composition	Microbe / probiotic Fibre	N/A
Bifidobacterium animal and application thereof in controlling diabetes or hyperlipidemia, particularly in weight gain or obesity	CN110604749A	2019-12-24	Beijing Univ Of Agri	Type II Diabetes Obesity / Body composition Dyslipidaemia Glycaemic control	Microbe / probiotic	N/A

Title	Publication Number	Publication Date	Owner	Health Focus	Primary actives	HVN Food link
Synergy for increasing energy expenditure and insulin sensitivity	WO2020092905A1	2020-05-07	Louisiana State University	Type II Diabetes Obesity / Body composition Glycaemic control	N/A	N/A
Low-carbohydrate food combination meal for preventing and nursing chronic metabolic syndrome	CN110477384A	2019-11-22	Henan Yushengtang Food & Nutrition Technology Co., Ltd.	Whole diet approaches	N/A	N/A

8. THE EXTRA STUFF

8.1. Searching and Refinement Process

The search and refinement process was carried out in the following steps:

- Preparation of search criteria including key words and International Patent Classifications (IPCs) to target subject matter of interest, testing and refining to ensure relevant subject matter found. Searching using Boolean search criteria within PatSnap software accessing over 130 million published patents globally, to develop an initial raw dataset of patent families. The search and the results of this report captures new patents published between 23 March 2019 to 2 June 2020, and with a priority date after 23 September 2017.
- From a total of 1626 raw search results, we filtered these down to 264 patent families that we deemed relevant to HVN's Metabolic Health platform based on the subject matter defined in [Section 1.3](#). A total of 593 patents relating to traditional herbal medicines were also separated out and kept as a different dataset which may be accessed as needed.
- We then further classified each “relevant” patent by the health target(s), type of active(s), and type of food(s). Each relevant patent was then classed as Bull's Eye, Halo or Background as previously defined in section 1.3. The list of all relevant patents and links to the full text are provided in Sections 5-7.

8.2. Author of this Report

This updated report was prepared by Dr. Peter Brown, Director of IPSynergy (www.IPSynergy.co.nz). Peter is a registered patent attorney in NZ and Australia, holds a PhD in protein biochemistry and has substantial commercial experience dealing with food science, innovation and IP strategies. If you have any questions regarding this report, please feel free to contact Peter (peter.brown@ipsynergy.co.nz).