



BioTeke

BioTeke Life Sciences

**Guideline to
Nutritional Rehabilitation Products
for Type 2 Diabetes**

百泰克生命科學

糖尿病營養康復產品指南

2型糖尿病是一種因後天飲食習慣形成的“高糖、高脂、高炎”為特徵的代謝性疾病^[1-3]，可以通過後天的飲食和運動管道調理達到自我康復的目的^[4-6]，百泰克生物利用自身強大的研發團隊，研發出一整套食療調理的產品，幫助患者調理糖尿病，通過3~6個月的自我管理，實現降低血糖及減藥或停藥的效果，幫助身體恢復健康。

Type 2 diabetes is a metabolic disease characterized by "hyperglycemia, hyperlipidemia, and chronic inflammation," which is formed due to acquired dietary habits^[1-3]. It can be managed and self-recovered through proper diet and exercise^[4-6]. Baitaike Biology, leveraging its strong R&D team, has developed a comprehensive set of dietary therapy products to assist patients in managing diabetes. With 3 to 6 months of self-management, these products aim to reduce blood glucose levels and achieve the effect of reducing or discontinuing medication, helping the body to regain health.

① 控制糖和碳水攝入

控制2型糖尿病患者對糖分和碳水的攝入，將過於油膩、糖分過高的成分攔截在外，控糖的同時控制體重，達到減重與控糖雙向並行的目的，有利於控制體內血糖，避免血糖值的大幅度波動^[7,8]。

1. Controlling Sugar and Carbohydrate Intake

For type 2 diabetes patients, it is essential to control the intake of sugar and carbohydrates, intercepting overly greasy and high-sugar components. This dual approach of sugar control and weight management aims to achieve the goal of weight loss and blood glucose control simultaneously, which is beneficial for regulating blood glucose levels and preventing significant fluctuations in blood glucose values^[7,8].

多元營養②號餐固體飲料

本產品含豐富蛋白質，低碳水化合物，高膳食纖維。

低碳全營養飲食，有利於控制血糖，在低碳的環境下減少患者胰島β細胞功能負擔，在降低體重及血脂的同時避免碳水過低導致的酮過高，研發時參攷了中國膳食寶塔推薦的營養素攝入比例，保證身體所需營養元素有效攝入^[9,10]。

No.2 Multi-Nutrient Meal Replacement Powder

This product is rich in protein, low in carbohydrates, and high in dietary fiber.

A low-carb, fully nutritious diet is conducive to blood glucose control, reducing the functional burden on the islet β-cells of patients in a low-carb environment. It helps to lower body weight and blood lipids while avoiding ketosis caused by excessively low carbohydrates. The development referenced the recommended nutrient intake ratios from the Chinese Dietary Pagoda, ensuring effective intake of the essential nutrients required by the body^[9,10].



燃味喵蘆薈植物飲料

主食伴侶，如果不吃主食或者只吃②號餐就可以不用，餐前飲用可以減緩餐後血糖上升速度。抑制蔗糖酶活性，從而抑制蔗糖的吸收；抑制α-澱粉酶的作用，阻斷澱粉分解，減少葡萄糖吸收，從而起到減緩餐後血糖升高、減少胰島素分泌、降低脂肪合成等作用^[11-14]。

Natural Aloe Beverage

This product serves as a companion to staple foods (it can be omitted if staple foods are not consumed or if only the ② meal replacement powder is taken). When consumed before meals, it can slow down the postprandial increase in blood glucose levels. The product works by inhibiting the activity of sucrase, thereby suppressing the absorption of sucrose; it inhibits the action of α-amylase, blocking the breakdown of starch, reducing glucose absorption, and thus playing a role in slowing the rise in postprandial blood glucose, reducing insulin secretion, and decreasing fat synthesis^[11-14].

② 重塑腸道微生態

通過修復腸道微生態，促進糖脂代謝，抑制腐敗菌及腸道炎症，改善患者胰島素敏感性的作用^[15,16]。

2. Reshaping the Gut Microbiota

By repairing the intestinal microbiota, it promotes sugar and lipid metabolism, inhibits putrefactive bacteria and intestinal inflammation, and improves the insulin sensitivity of patients^[15,16].



活性益生菌固體飲料

含有國家專利認證菌株, 8種益生菌+2種益生元+4大功能原料, 總計400億高效活性益生菌, 抑制腐敗菌, 改善腸道炎症和糖脂代謝功能^[17,18]。

Active Probiotic Powder

The product contains strains with national patent certification, featuring 8 probiotics, 2 prebiotics and 4 major functional ingredients, totaling 40 billion highly efficient active probiotics. It inhibits pernicious bacteria, and improves intestinal inflammation and the function of sugar and lipid metabolism^[17,18].

③ 啟動休眠的胰島β細胞

在高糖/高脂/高炎的長期損害下, β細胞失去了分泌胰島素的能力, 轉變為分泌其他激素, 而細胞本身並沒有凋亡。科學的營養康復方案, 可以將休眠β細胞喚醒, 讓它們能夠重新分泌胰島素^[19-21]。

3. Activating Dormant Islet β-Cells

Under the long-term damage of hyperglycemia, hyperlipidemia, and chronic inflammation, β-cells undergo dedifferentiation and gradually lose their ability to secrete insulin, but the cells themselves do not apoptosis. A scientific nutritional rehabilitation program can awaken these dormant cells, allowing them to redifferentiate and secrete insulin again^[19-21].

菊芋肽苦瓜茶多酚固體飲料

含有菊芋肽^[22]、苦瓜肽^[23,24]、桑葉提取物^[25,26]等大量植物小分子肽, 以及維他命D、白芸豆粉、人參粉等多重營養元素, 對胰島功能的調節有顯著作用。

Chrysanthemum Peptide Bitter Melon Tea Polyphenol Solid Beverage

This product contains a wealth of plant small molecule peptides such as chicory peptides^[22], bitter melon peptides^[23,24], and mulberry leaf extracts^[25,26], as well as multiple nutritional elements like vitamin D, white kidney bean powder, and ginseng powder, which have a significant effect on the regulation of islet function.



④ 糾正胰島素抵抗——運動管理

運動能夠提高機體對於胰島素的敏感性, 還能夠打開葡萄糖轉運到肌肉細胞的“大門”, 繞過胰島素的作用障礙^[27,28]。

4. Exercise Management - Correcting Insulin Resistance

Exercise can directly deplete the glucose in the bloodstream. An appropriate amount of resistance exercise can also increase muscle mass, improve the body's sensitivity to insulin, and open the gateway for glucose transport into muscle cells, which helps to lower blood glucose levels^[27,28].

“有氧運動”聯合“抗阻運動”

有氧運動: 步行、慢跑、打太極拳、騎自行車、跳健身舞、做韻律操等。

抗阻運動: 舉啞鈴、做仰臥起坐、俯臥撐、深蹲、臀橋等。

"Aerobic Exercise" combined with "Resistance Exercise"

Aerobic Exercise: Walking, jogging, practicing Tai Chi, cycling, dancing, and rhythmic gymnastics, etc.

Resistance Exercise: Dumbbell lifting, sit-ups, push-ups, squats, hip bridges, etc.

食用方法: 每餐2袋②號餐替代主食(如果吃少量米麵及其他碳水, 餐前可喝燃卡啞1瓶減少昇糖)和適量的蛋白(海鮮河鮮肉蛋均可)和蔬菜; 每天2袋益生菌和1袋菊芋肽, 白天溫水吞服即可。

注意事項: 所有產品用水均不得高於37°C, 長期儲存不高於25°C。為防止低血糖情況, 請自備糖果以防萬一。調理過程會有血糖陸續下降的過程, 如果空腹血糖低於5.5, 可以聯系主治醫師申請逐步減藥, 有不明白的地方請諮詢營養師。

Consumption Method: For each meal, replace the staple food with 2 packets of No. 2 meal replacement powder (if consuming a small amount of rice, noodles, or other carbohydrates, drink 1 bottle of aloe drink before the meal to prevent a rapid increase in blood glucose after meals), along with an appropriate amount of protein (seafood, river delicacies, meat, and eggs are all acceptable) and vegetables; take 2 packets of probiotics and 1 packet of chicory peptides solid beverage daily, to be swallowed with warm water during the day.

Precautions: The water used for dissolving all products and for swallowing should not exceed 37°C. Long-term storage of the products should not exceed 25°C. To prevent hypoglycemia, please keep some candy with you for emergencies. During the adjustment process, blood glucose will gradually decrease. If the fasting blood glucose is below 5.5, you could contact your attending physician to apply for a gradual reduction in medication. If you have any questions, please consult a dietitian. Avoid consuming high GI foods, such as rice porridge, desserts, pastries, etc.

References

- [1] DEFONZO R A. From the Triumvirate to the Ominous Octet: A New Paradigm for the Treatment of Type 2 Diabetes Mellitus[J/OL]. *Diabetes*, 2009, 58(4): 773-795. DOI:10.2337/db09-9028.
- [2] TAYLOR R, AL-MRABEH A, SATTAR N. Understanding the mechanisms of reversal of type 2 diabetes[J/OL]. *The Lancet Diabetes & Endocrinology*, 2019, 7(9): 726-736. DOI:10.1016/S2213-8587(19)30076-2.
- [3] RIDDLE M C, CEFALU W T, EVANS P H, et al. Consensus report: definition and interpretation of remission in type 2 diabetes[J/OL]. *Diabetologia*, 2021, 64(11): 2359-2366. DOI:10.1007/s00125-021-05542-z.
- [4] LEAN M E, LESLIE W S, BARNES A C, et al. Primary care-led weight management for remission of type 2 diabetes (DIRECT): an open-label, cluster-randomised trial[J/OL]. *The Lancet*, 2018, 391(10120): 541-551. DOI:10.1016/S0140-6736(17)33102-1.
- [5] TAYLOR R. Type 2 diabetes and remission: practical management guided by pathophysiology[J/OL]. *Journal of Internal Medicine*, 2021, 289(6): 754-770. DOI:10.1111/joim.13214.
- [6] TAHERI S, ZAGHLOUL H, CHAGOURY O, et al. Effect of intensive lifestyle intervention on bodyweight and glycaemia in early type 2 diabetes (DIADEM-1): an open-label, parallel-group, randomised controlled trial[J/OL]. *The Lancet Diabetes & Endocrinology*, 2020, 8(6): 477-489. DOI:10.1016/S2213-8587(20)30117-0.
- [7] FARDET A, AUBRUN K, ROCK E. Nutrition transition and chronic diseases in China (1990-2019): industrially processed and animal calories rather than nutrients and total calories as potential determinants of the health impact[J/OL]. *Public Health Nutrition*, 2021, 24(16): 5561-5575. DOI:10.1017/S1368980021003311.
- [8] LEY S H, HAMDY O, MOHAN V, et al. Prevention and management of type 2 diabetes: dietary components and nutritional strategies[J/OL]. *The Lancet*, 2014, 383(9933): 1999-2007. DOI:10.1016/S0140-6736(14)60613-9.
- [9] THOMSEN M N, SKYTTE M J, SAMKANIA, et al. Dietary carbohydrate restriction augments weight loss-induced improvements in glycaemic control and liver fat in individuals with type 2 diabetes: a randomised controlled trial[J/OL]. *Diabetologia*, 2022, 65(3): 506-517. DOI:10.1007/s00125-021-05628-8.
- [10] Chinese Nutrition Society. *Dietary Guidelines for Chinese Residents (2022)* [M]. Beijing: Chinese Nutrition Society, 2022.
- [11] FENG Q, NIU Z, ZHANG S, et al. Protective Effects of White Kidney Bean (*Phaseolus vulgaris* L.) against Diet-Induced Hepatic Steatosis in Mice Are Linked to Modification of Gut Microbiota and Its Metabolites[J/OL]. *Nutrients*, 2023, 15(13): 3033. DOI:10.3390/nu15133033.
- [12] Liu Pu, Yin Jiaming, Zhang Xin, et al. The activation of insulin signaling pathway and its mechanism in HepG2 cells by anthraquinone compounds from *Rheum palmatum* L. [J]. *Chinese Journal of Geriatric Multi-Organ Disease*.
- [13] DONG J Y, ZHANG Y H, WANG P Y, et al. Meta-analysis of dietary glycemic load and glycemic index in relation to risk of coronary heart disease[J]. *The American Journal of Cardiology*, 2012, 109 (11) : 1608 - 1613.
- [14] SONG H Z, HAN W, YAN F J, et al. Dietary phaseolus vulgaris extract alleviated diet-induced obesity, insulin resistance and hepatic steatosis and alters gut microbiota composition in mice [J]. *Journal of Functional Foods*, 2016, 20: 236 - 244.
- [15] SALGAÇO M K, OLIVEIRA L G S, COSTA G N, et al. Relationship between gut microbiota, probiotics, and type 2 diabetes mellitus[J/OL]. *Applied Microbiology and Biotechnology*, 2019, 103(23-24): 9229-9238. DOI:10.1007/s00253-019-10156-y.
- [16] RÉGNIER M, VAN HUL M, KNAUF C, et al. Gut microbiome, endocrine control of gut barrier function and metabolic diseases[J/OL]. *Journal of Endocrinology*, 2021, 248(2): R67-R82. DOI:10.1530/JOE-20-0473.
- [17] Uusitupa H M, Rasinkangas P, Lehtinen M J, et al. *Bifidobacterium animalis* subsp. *lactis* 420 for Metabolic Health: Review of the Research[J]. *Nutrients*, 2020, 12(4): 892.
- [18] ZL202210476137.9-A strain of *Bifidobacterium bifidum* that has the effects of reducing fat and alleviating hyperglycemia, and regulating intestinal immunity, as well as its application.
- [19] CINTI F, BOUCHI R, KIM-MULLER J Y, et al. Evidence of β -Cell Dedifferentiation in Human Type 2 Diabetes[J/OL]. *The Journal of Clinical Endocrinology & Metabolism*, 2016, 101(3): 1044-1054. DOI:10.1210/jc.2015-2860.
- [20] TALCHAI C, XUAN S, LIN H V, et al. Pancreatic β Cell Dedifferentiation as a Mechanism of Diabetic β Cell Failure[J/OL]. *Cell*, 2012, 150(6): 1223-1234. DOI:10.1016/j.cell.2012.07.029.
- [21] KHIN P P, LEE J H, JUN H S. A Brief Review of the Mechanisms of β -Cell Dedifferentiation in Type 2 Diabetes[J/OL]. *Nutrients*, 2021, 13(5): 1593. DOI:10.3390/nu13051593.
- [22] Zhong Shuning, Wang Yumin. Chrysanthemum peptides for lowering blood sugar and antioxidant activity, their preparation method and application [P]. Fujian Province: CN202310297723.1, February 27, 2024.
- [23] Peter E L, Kasali F M, Deyno S, et al. *Momordica charantia* L. lowers elevated glycaemia in type 2 diabetes mellitus patients: Systematic review and meta-analysis[J]. *Journal of ethnopharmacology*, 2019, 231: 311-324.
- [24] Liu Z, Gong J, Huang W, et al. The effect of *Momordica charantia* in the treatment of diabetes mellitus: A review[J]. *Evidence - Based Complementary and Alternative Medicine*, 2021, 2021(1): 3796265.
- [25] Thakur K, Zhang Y Y, Mocan A, et al. 1-Deoxyojirimycin, its potential for management of non-communicable metabolic diseases[J]. *Trends in Food Science & Technology*, 2019, 89: 88-99.
- [26] Ren X, Xing Y, He L, et al. Effect of 1-Deoxyojirimycin on insulin resistance in prediabetic mice based on next-generation sequencing and intestinal microbiota study[J]. *Journal of Ethnopharmacology*, 2022, 289: 115029.
- [27] Sarathi V, Kolly A, Chaithanya HB, et al. High rates of diabetes reversal in newly diagnosed asian Indian young adults with type 2 diabetes mellitus with intensive lifestyle therapy. *J Nat Sci Biol Med*, 2017, 1 : 60-63.
- [28] Nieuwoudt S, Fealy CE, Foucher JA, et al. Functional high intensity training improves pancreatic β -cell function in adults with type 2 diabetes. *Am J Physiol Endocrinol Metab*, 2017, 407: 2016.



生產基地面積超：**17000** 平米



授權專項：**80** 項



產品覆蓋：全球**100** 多個國家地區

百泰克生命科學

☎ 400-678-8982

📍 無錫惠山經濟開發區華清創智園11棟1樓

營養師諮詢

