




CH3

Innovation and R&D



Target Formulation

	Targets for 2024-2025	Targets for 2026-2027	Targets for 2028 and beyond	Corresponding SDGs
Brand Marketing	<ul style="list-style-type: none"> We keep striving to be “A health expert for the entire family.” We provide the public with healthy and safe products, and our advertisements and promotions all adhere to food safety laws. We continue to strengthen awareness of health food and energy drinks for younger groups. Establish a consumer data center, make good use of one party's data, and improve advertising efficiency. Brand Refresh Plan : Packaging Upgrade, Online store Upgrade. 	<ul style="list-style-type: none"> Establish mechanisms for an OEM brand and use relevant promotion materials to expand our reach into international markets beginning with ODM/OEM services. We may also expand into other markets using our own private label brands. Establish a promotional policy and brand image focused on responsible advertising, sales, and accountability labeling in response to the ESG trend, 	<ul style="list-style-type: none"> Form alliances with overseas and local brands, or further strengthen our corporate advantages through acquisitions as we work to become an international brand 	 
Customer Services	<ul style="list-style-type: none"> Regularly assess relevant indicators through satisfaction surveys to increase “complete satisfaction” rates. Our customer service staff participate in training organized by professional institutes each year and obtain related certificates. Conduct product refresher training courses led by professional nutritionists to enhance product expertise. Establish a comprehensive database of frequently asked questions from customers to ensure consistency and accuracy in service quality. Establish a new Customer Data Platform (CDP) database to analyze, track, and manage customer interactions and integrate data to greatly strengthen marketing efficiency and customer service. 	<ul style="list-style-type: none"> Continually conduct product refresher training courses led by professional nutritionists to enhance product expertise. Continually update a comprehensive database of frequently asked questions from customers to ensure consistency and accuracy in service quality. Enhance customer satisfaction successfully through the utilization of the Customer Data Platform (CDP), which can predict potential issues and concerns that customers may have with purchased products or services. Proactively address these concerns and provide customers with the necessary resources to increase their satisfaction. 	<ul style="list-style-type: none"> Establish a complete customer service and nutritionist team to provide comprehensive health, diet, and lifestyle recommendations to customers based on data analysis and historical records. 	

3.1 Innovation Management and Patents

General manager
of Biotech Research
Institute
Jin-Chu Chen

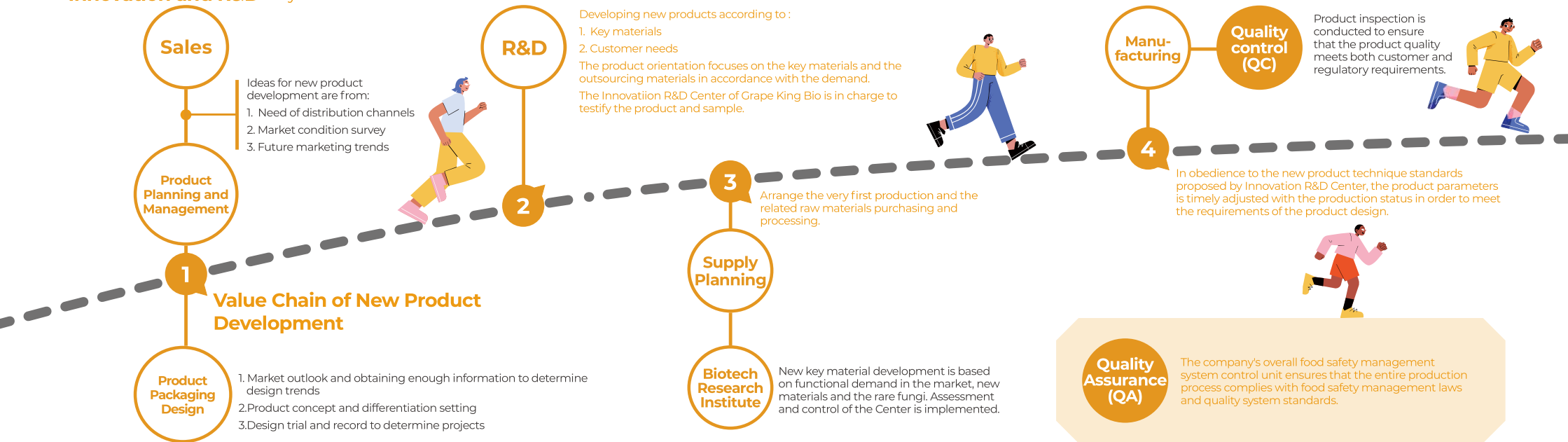
“
Material R&D at our Biotech Research Institute incorporates cutting-edge technologies and collaborations with experts. Our products have achieved successes both at home and overseas, and we hope to enhance the health of the public.
”

Director of Biotech
Research Institute
Yen-Lien Chen

“
Grape King Bio's fungal fermentation technology serves as an industrial benchmark. We will continue to develop new technologies to meet the future needs of society.
”

Value chain for
development of new
products
Ya-Ling Liu

Product Innovation and Sustainability Innovation and R&D Key issues: Innovation and R&D



Management Approach	Key issue-Innovation and R&D	
Policies	Combine core capabilities, external research, and innovation units to develop unique Grape King Bio functional materials or formulations in response to consumer demands and market trends.	
Commitments	We strive to ensure product safety and legal compliance while developing products for appropriate target groups.	
Targets	Short-term	<ul style="list-style-type: none"> In response to our aging society and the ongoing coronavirus pandemic, we screened and researched functional materials for relevant issues such as osteoarthritis, sarcopenia, kidney damage, fatigue, sports performance improvement. Due to the global increase in health-consciousness and environmental awareness in diets, research and development are being conducted on fermented-source alternative protein materials derived from fungi and their derivatives. The Biocenter and Innovation Research Center are expected to submit over 20 patent applications in 2024 related to material functionality applications and corresponding product development strategies.
	Mid-term	<ul style="list-style-type: none"> Complete commercial production on 3 novel biotechnology materials for PMS, ADHD, hearing impairments, Parkinson's disease, sleep, and kidney health, enhancing sports performance, building muscle and losing fat. Establish specifications and commence pre-clinical animal trials for new plant-based medicines, gradually strengthening our ability to become a sophisticated API manufacturer. Analyze current major health trends and form cross-industry alliances where necessary to design products for specific groups and health needs. Develop formulations and products that adhere to environmental protection and sustainability concepts.
	Long-term	<ul style="list-style-type: none"> Complete commercial production for 6 biotechnology cosmetic ingredients with anti-aging, anti-allergy, skin care, and hair care properties. Complete commercial production on 6 novel biotechnology materials for improving depression, PMS, ADHD, hearing impairments, Parkinson's disease, sleep, kidney health, enhancing sports performance and building muscle and losing fat. Continue to track food and health industry trends, and form cross-industry alliances with local companies where necessary to develop formulations and products with unique features that comply with the needs of specific groups while adhering to environmental protection and sustainability concepts.
Responsibilities	External responsible unit: Food and Drug Administration of the Ministry of Health and Welfare, Department of Health of Taoyuan City Government	
Resources	In 2023, our Innovation and Research Center newly hired 1 employee with a graduate degree.	
Specific performance	<ul style="list-style-type: none"> ✓ Received 30 gold medals, 2 silver medals, and 14 special awards at the International Invention Awards ✓ Received Annual Industry Innovation Award at the Taiwan Bio Industry Organization Awards ✓ Received SNQ (Symbol of National Quality) certification for 2 products ✓ Continued to extend the efficacy of key materials such as Lactobacillus bacteria, fungal Alternative Protein Material, Hericium erinaceus, Hirsutella sinensis, and others 	

Continued development and innovation is an important component of sustainable management. Grape King Bio is committed to innovation and development of different products and services, and we continue to invest our resources and efforts. Development and applications at our Biotech Research Institute and Innovation and Research Center are conducted in tandem with domestic and foreign institutes. We developed a variety of products and components to attract collaboration with other associations and have submitted applications for multiple patents, showcasing our great achievements. Grape King Bio invested NT\$289,545,000 in innovation and R&D in 2023.

Innovative Research and Development Information	Unit	2021	2022	2023
R&D Expense	NT\$ Thousand	292,228	289,884	289,545
R&D Full-time employees	Full-time employees	132	140	123
Percentage of R&D Expense to Sales	Percentage	3%	3%	3%

Major Milestones for 2023

- Two of our products (Pro-Partner's "Hericium erinaceus mycelium capsules" and Antrodia cinnamomea) received SNQ (Symbol of National Quality) certification in the health food group and special functional health ingredient group of the nutrition & dietary supplement category.
- Received NT\$11.2 million grant from Industrial Upgrading Innovation Platform Guidance Program by the Ministry of Economic Affairs for "High-Fiber and High Protein Fungal Meat Substitute Research" project.
- Received NT\$3.63 million grant from Precision Health Cross-domain Promotion Plan by the Hsinchu Science Park Bureau, National Science and Technology Council for "Clinical Study on Precision Application of Clostridium Butyricum in Osteoarthritis" project in 2023.



R&D award highlights for 2023 were as follows :

Invention awards received in 2023			
Item	Event	Patents	Award
1	2023 Russian Archimedes International Invention Exhibition	"A Composition based on Probiotics for increasing resistance against H1N1 influenza virus"	Gold medal
2		"Phellinus linteus for improving sarcopenia"	Gold medal / special award
3	2023 Malaysia Technology Expo	"An active substance of Lactobacillus plantarum GKM3, promoting longevity genes and delaying aging"	Silver medal
4		"Use of lignosus rhinocerus mycelia active substance for improving chronic obstructive pulmonary disease"	Silver medal
5	2023 International Invention, Innovation & Technology Exhibition (ITEX) in Malaysia	"An active substance of Bifidobacterium lactis GKK2, a composition comprising thereof and its use for promoting longevity"	Gold medal
6		"An active substance for the treatment of dementia, its preparation methods, pharmaceutical combination comprising thereof, and the preparation methods of the pharmaceutical combination"	Gold medal / special award
7	2023 World Genius Convention and Education Expo in Tokyo	"An active substance of Bifidobacterium lactis GKK2, a composition comprising thereof and its use for promoting longevity"	Gold medal / special award
8		"Use of Morchella active substances for improving sarcopenia"	Gold medal
9	2023 International Invention & Innovation Expo in Shanghai	"Lactobacillus plantarum and its use for lowering uric acid, improving allergies, and reducing blood glucose"	Gold medal / special award
10		"Lactobacillus plantarum and its use for lowering blood lipids, liver enzymes, uric acid and reducing inflammation"	Gold medal / special award
11		"A Lactobacillus rhamnosus GKLC1, a composition and its use for improving alcoholic injury in liver, stomach and/or intestine"	Gold medal
12	2023 INNOVERSE Invention & Innovation Expo in the USA	"Use of Cordyceps cicadae mycelia for improving steroid-induced ocular complications"	Gold medal / special award
13		"Lactobacillus fermentum GKJOY for effectively improving psychataxia"	Gold medal
14	2023 World Invention and Innovation Contest (WIC) in Korea	"Use of Phellinus linteus for preparing compositions for improving sarcopenia"	Gold medal / special award
15		"Use of lactic acid bacteria in improving resistance to enterovirus type 71"	Gold medal

16	2023 All American DAVINCI International Innovation and Invention Expo	"Use of Bifidobacterium lactis GKK2 for improving allergic asthma"	Gold medal
17		"Use of novel probiotic strains GKM3® and GKS6® for keeping bones healthy"	Gold medal
18	2023 International Invention Innovation Competition in Canada (ICAN)	"Cordyceps cicadae mycelia for improving cataract"	Gold medal / special award
19		"Lactobacillus fermentum GKF3 for effectively improving psychataxia"	Gold medal / special award
20	2023 International Invention and Trade Expo in London	"Use of Phellinus linteus for preparing compositions for improving sarcopenia"	Gold medal / special award
21		"A Composition based on Probiotics for increasing resistance against H1N1 influenza virus"	Gold medal
22	2023 International Innovation and Invention Competition (IIIC)	"Lactobacillus fermentum GKF3 for effectively improving psychataxia"	Gold medal
23		"Use of Bifidobacterium lactis GKK2 for improving allergic asthma"	Gold medal
24		"Use of novel Probiotics-GKM3 for weight control"	Gold medal
25	2023 Hong Kong International Invention and Design Competition	"A Lactobacillus rhamnosus GKLC1, a composition and its use for improving alcoholic injury in liver, stomach and/or intestine"	Gold medal
26		"An active substance for preventing hearing loss, its preparation methods, pharmaceutical combination comprising thereof, and the preparation methods of the pharmaceutical combination"	Gold medal / special award
27	2023 International Salon of Inventions and New Technologies	"A Composition based on Probiotics for increasing resistance against H1N1 influenza virus"	Gold medal
28		"Use of Phellinus linteus for preparing compositions for improving sarcopenia"	Gold medal
29	2023 14th International Invention and Innovation Show INTARG	"Use of Phellinus linteus for preparing compositions for improving sarcopenia"	Gold medal / special award
30		"An active substance for the treatment of dementia, its preparation methods, pharmaceutical combination comprising thereof, and the preparation methods of the pharmaceutical combination"	Gold medal / special award
31	2023 International Invention Show (INOVA in Croatia)	"An active substance for the treatment of dementia, its preparation methods, pharmaceutical combination comprising thereof, and the preparation methods of the pharmaceutical combination"	Gold medal / special award
32		"Bifidobacterium lactis GKK2 for effectively improving airway hypersensitivity"	Gold medal



3.1.1

Sustained Growth of Material Development Capabilities

1. Grape King Biotech Research Institute (Longtan Branch)

Our Bioengineering Center was established in 1991 and was upgraded to a “Biotech Research Institute” in 2019. The Biotech Research Institute is responsible for developing materials and product production. In terms of R&D, the Biotech Research Institute is responsible for developing and applying our self-developed materials (key components) and actively collaborates with domestic academic and research institutes to develop products, verify product efficacy, and improve processes so as to establish core technologies for our company.

Our domestic and overseas collaboration projects and patents obtained in 2023 include :

- There are around 25 industry-academia collaboration projects with the Ministry of Science and Technology, the Council of Agriculture, the Ministry of Education, and various colleges and universities, bringing the total to 208 projects.
- We currently hold 197 patents; we applied for 43 patents in 2023 and received approval for 36.

The Grape King Bio Biotech Research Institute, which cost NT\$1.6 billion to build, was completed in 2019. Grape King Bio currently has six 1-ton, one 2-ton, one 3-ton, five 5-ton, one 10-ton, two 15-ton, four 20-ton, four 40-ton, and one 50-ton large-scale fermentation tanks as well as eighty 100-liter small-scale fermentation tanks. The fermentation capacity over the whole Group has reached 386 tons, the largest capacity seen in the domestic health food manufacturing industry. We implemented automated freeze-drying processes to reduce pollution rates and maintain stable quality. Our downstream production equipment include membrane

coating machines, freeze-drying machines, centrifuge machines, low temperature continuous flow drying machines, and filter press machines, which make raw materials for health foods used by Grape King Bio, Pro-Partner, our Shanghai company, and other OEM manufacturers.

The Biotech Research Institute has two 5-ton, two 15-ton, one 20-ton, and one 40-ton fermentation tanks, making for a total production capacity of 100 tons. These tanks have been used for producing and developing fermented materials from fungi and lactic acid bacteria. Commercial production processes have officially commenced. In 2023, our Longtan Factory produced 59 product items and total production weight reached 84,871 kgs.

Our Biotech Research Institute owns proprietary fungal fermentation technologies and the largest organizational fermentation production capacity (386 tons) in Taiwan, achieving a ten-year head start over our industry peers. We combined several dozen patented production technologies with exclusive materials and procured raw materials to develop unique formulations. Apart from classic products such as Ganoderma King, Antrodia King, and Probiotic King, we also developed new products such as Kombucha Double Fiber Drink, Bio Marigold Lutein Extract Jelly, Sliim Turmeric Complex EX, PowerBOMB Energy Drink, which are popular with the public.

Additionally, many of our developed products have received acclaim, including the Grape King Bio LGG Probiotics, Ganoderma King, Antrodia King mycelium capsules, Ling Zhi Anti-Allergy, Gold Combest Energy Drink, Combest Energy Drink (Liver Protection Certification), and Sliim Probiotic King capsules; these eight products received health mark certifications.

2. Development and Patenting of Key Materials

Developing ingredients for health and beauty products is one of the main focuses of the R&D team at Grape King Bio. We have developed the following materials :

- Cordyceps cicadae mycelium → Protect renal functions and prevents dry eye syndrome
- Hericium erinaceus mycelium → Rich in Erinacine A, which can trigger the generation of nerve growth factor (NGF) in glial cells
- Tiger milk mushroom (Lignosus rhinoceros), Malaysia’s national treasure → Prevent asthma
- Lepista nuda mycelium → Produces antioxidant Ergothionione



Grape King Bio continues to conduct analyses and tests regarding the efficacy of our developed materials :

- ✓ We screen lactic acid bacteria strains with properties to delay aging, enhance hair growth, improve fertility functions, reduce addictions, and prevent depression
- ✓ We continue to analyze Cordyceps cicadae mechanisms for reducing intraocular pressure, fighting kidney damage, and alleviating allergy effects
- ✓ We continue to analyze and research Hericium erinaceus properties for preventing premenstrual syndrome, neural damage regeneration, anti-inflammation functions, improving depression and sleep, preventing degenerative joint diseases, and protecting against brain ischemia
- ✓ Application and Promotion of Fungal Alternative Protein Materials
- ✓ Clinical Trials on osteoarthritis with Clostridium butyricum Material

In 2023, we researched and upgraded four major technologies, applied new technologies to R&D of new formulations, and developed different product formulations to meet various customer demands, including :

- Soft capsules
- Super mixer granulation (SMG)
- Gels
- Fluid bed granulation

• Our Biotech Research Institute also accepts OEM and ODM requests, including work on :

- Fungi materials (such as Ganoderma lucidum, Agaricus blazei, Antrodia cinnamomea, Cordyceps sinensis, Coriolus versicolor, and others)
- Probiotics (such as cocci, bacilli, bifidobacterium, saccharomyces, and clostridium)
- Other edible microbes, enzymes, and metabolites

Grape King Bio is committed to material development, efficacy verification, and process improvements that strengthen our core technologies. We currently hold 197 patents; we applied for 36 patents in 2023 and received approval for 43.

Patents obtained by Grape King Bio in 2023

	Patent Title	Country	Patent Number
1	Use of lignosus rhinoceros mycelia active substances for ameliorating chronic obstructive pulmonary disease	Malaysia	MY-195667-A
2	Use of mycelium of Deinococcus spp. for manufacturing pharmaceutical composition for angiogenesis inhibition	Taiwan	I791918
3	Method of manuacuuring and the ues of cordyceps cicadae mycelia active substance for preventing and/or improving acute lung injury	Canada	3,040,916
4	Complex probiotic composition for alleviating overactive bladder syndrome and use thereof	Taiwan	I802077
5	Active substances of bifidobacterium lactis GKK2, composition comprising the same and method of promoting longevity using the same	Singapore	10201907542S
6	Use of mycelium of phellinus linteus GKPI for preparing composition of improving obesity and obesity-related metabolic disorders	Taiwan	I792756
7	Active substances of bifidobacterium lactis GKK2, composition comprising the same and method of promoting longevity using the same	Singapore	1020190754R
8	A Bifidobacterium lactis GKK2, a composition comprising thereof and its use for improving allergic asthma	United States	
9	Use of probiotic bacteria in preparation of medical composition for reducing syndromes related to relapse of drug addiction.	Taiwan	I795087
10	A composition containing Lactobacillus spp. and its use for preventing and/or improving anti-aging of skin	Taiwan	I794766
11	A Bifidobacterium lactis GKK2, a composition comprising thereof and its use for improving allergic asthma	Singapore	10201907549U
12	Lactobacillus fermentum GKF3, composition comprising the strain and method for improving psychataxia using the same	Singapore	10201910740U
13	Uses of treating, preventing, or improving bone diseases by lactobacillus bacteria, pharmaceutical composition and edible composition thereof (M3 S6)	China	ZL 2018 1 1228535.9

14	Use of Morchella active substances	China	ZL 2020 1 1399434.5
15	Use of Phellinus linteus for preparing compositions for improving sarcopenia	Japan	7250065
16	Use of Hericium erinaceus mycelia active substance for preventing or curing retinopathy	Taiwan	I798936
17	Probiotic extracellular vesicles and the use thereof	Taiwan	I793595
18	Hericium erinaceus mycelia active substance and preparation method thereof with pain reducing effect, and pharmaceutical composition containing the same	United States	11,648,233
19	Granular structure with active compound of organic acids	Taiwan	M641394
20	A use of manufacturing a composition for improving the immunity	Taiwan	I803730
21	Use of lactic acid bacteria for manufacturing an antiviral composition (Division)	Taiwan	I805237
22	Multilayer antioxidant coating lactic acid bacteria (Maoc-Lab) microencapsule and method of producing the same	Taiwan	I805932
23	Use of lactic acid bacteria for increasing resistance against enterovirus 71	Taiwan	I807609
24	Wound external composition containing lactic acid bacteria fermentation product	Japan	7297021
25	Use of probiotics for preparing oral compositions to improve sarcopenia	Japan	7301117
26	An active substance of morchella, its use and a composition thereof for improving the reproductive function	United States	US 11,730,783 B2
27	Use of Cordyceps cicadae active substance for improving visual acuity	Taiwan	I811009
28	Use of Lactobacillus reuteri strain GKRI for preparing uric acid lowering composition	China	ZL 2020 1 0939422.0
29	Method of reducing Tobacco addiction in smoking subject with lactobacillus fermentum GKF3	United States	11,752,177 B2
30	An active substance of Bifidobacterium lactis GKK2, a composition comprising thereof and its use for promoting longevity	China	ZL 2018 1 1083391.2



31	An active substance of <i>Lactobacillus plantarum</i> GKM3, a composition comprising thereof and its use for promoting longevity	China	ZL 2018 1 1092850.3
32	An active substance of <i>Lactobacillus paracasei</i> GKS6, a composition comprising thereof and its use for promoting longevity	China	ZL 2018 1 1093133.2
33	<i>Bifidobacterium lactis</i> GKK2, composition containing the same and use thereof for improving allergic asthma	China	ZL 2018 1 1083035.0
34	External composition for wound healing containing <i>Lactobacillus</i> fermentation product and method for promoting wound healing using the same	United States	11,766,465
35	Novel <i>Lactobacillus paracasei</i> GKS6 for improving metabolic syndromes, its medium, incubation method, use, pharmaceutical composition and edible composition	China	ZL 2018 8 0002040.6
36	Use of <i>Lactobacillus fermentum</i> GKF3 for preparing oral composition of reducing tobacco addiction	Japan	7344269
37	Use of complex probiotic for use of manufacturing composition for improving exercise performance of subject with low intrinsic aerobic exercise capacity	Taiwan	I817792
38	Complex probiotic composition for alleviating overactive bladder syndrome	Japan	Pending
39	An active substance of <i>Lactobacillus plantarum</i> GKM3, a composition comprising thereof and its use for promoting longevity	Malaysia	MY-196412-A
40	Use of lactic acid bacteria for increasing resistance against enterovirus 71	Taiwan	I817332
41	An active substance of <i>Lactobacillus paracasei</i> GKS6, a composition comprising thereof and its use for promoting longevity	Malaysia	MY-198618-A
42	Use of <i>Lactobacillus</i> fermentation product in preparation of external composition for enhancing skin wound healing	Taiwan	Pending
43	Use of lactic acid bacteria and composition thereof for promoting blood calcium and improving osteoporosis	Malaysia	Pending

Note: For more information on our patents, please refer to our company website : <https://www.grapeking.com.tw/tw/rd/patent-paper/patent>

3.1.2 Product Development and Customized Services

Along with the rise of civilization diseases, low birth rates, and other social trends, demographic structures are gradually moving to middle-aged and aged societies. Consumers are becoming more health aware, and pay more attention to food characteristics and health impacts. Therefore, nutritional content and functionality have also become relatively more important. Grape King Bio established an Innovation and Research Center (IRC) in 2016, gathering together elites from the product development, product planning, material development, quality control, and quality assurance departments. The IRC uses specialized fermentation technologies developed by the Biotech Research Center and assesses differentiated ingredients and raw materials from external sources to develop unique formulations in hopes of developing delicious and functional health foods so that customers can replenish nutrients and consume ingredients with specific functions by eating health foods.

Additionally, the Grape King online store has established a customer service center which compiles consumer feedback through phone or email, big data analysis, and information from market research companies. We also receive information on market needs through our marketing channels and distributors. For example, for products currently in development, we identify appropriate product types, specifications, and marketing strategies through actual market information provided by distributors, so that our products can better align with market needs.

IRC internal R&D team and responsibilities

1. Development of brand and OEM products
2. Development of analytical methods
3. Production trial runs for new products
3. Production trial runs for new products
4. Research on dosage forms and new technologies
5. Application for health food certifications and SNQ (Symbol of National Quality) certifications
6. Product efficacy trials (animal and human trials are outsourced) and stability trials
7. Formulation of specifications for raw materials and finished products
8. Product maintenance and raw material inventory management



1. Development of Physical Products

We launched our “new dosage form development” services in 2017. Development of new dosage forms is not limited to the production machines currently in factories, and largely include: the dropping pill category, the jelly (gel) category, the soft capsule category, the tablet (double-layer and chewable) category, and the household goods (shampoo and soap) category. Our R&D team utilizes the fermentation technologies at our Biotech Research Institute to satisfy the demands of different customer groups and nutritional needs as “A health expert for the entire family.” Our products can be divided into 9 main categories. We developed a total of 292 products in 2023.

Product	Chinese Herbal Range	Health Maintenance Range	Female Beauty Range	Children Healthcare Range	Energy Drink Range	Others	Tourist Factory	Pet Foods	External Products
Description	We use Chinese herbal formulations and our professional capabilities in fungal fermentation to develop comprehensive maintenance products for our consum	These products maintain normal physiological functions and help to satisfy the requirements of different age groups and nutritional needs, such as for gastrointestinal systems, bones and joints, vision, and cardiovascular health, which are all popular needs. Our lactic acid products are also suitable for customers of all ages.	All women naturally strive to be beautiful, and how to simply and quickly obtain necessary nutrients as part of a busy lifestyle is an issue that concerns all female consumers	All parents hope their babies can grow up healthy. These products have been developed to satisfy the nutritional requirements of pre-school aged children.	“Drink up ComeBest!” is a classic advertising slogan at Grape King Bio. This range of energy drinks can help to replenish energy and comes in multiple flavors.	Dietary imbalances are a part of modern lifestyles. Many people consume high-calorie foods but still feel hungry. We therefore provide nutrients that cater to customer needs, such as increasing satiety.	The Grape King Museum Factory was established in 2017 and helps to develop popular Grape King Bio products displayed within the museum, attracting consumers, and providing accessible and convenient foods.	Grape King Bio is adapting to the vast pet market and has developed pet health, beauty, and health food products to take good care of these cuddly pets.	We developed beauty products for high-level customers to expand the depth and breadth of our consumer groups.
Product Examples	<ul style="list-style-type: none"> Grape King Bio Double Effect Antrodia King Grape King Bio Double Effect Ganoderma King Hirsutella Sinensis Capsules 	<ul style="list-style-type: none"> Probiotics (Granule) Probiotics (Capsule) Carb Controller Fish Oil Soft Capsules 	<ul style="list-style-type: none"> Collagen Probiotic Powder Collagen Skin Brightening Powder Whitening Capsules 	<ul style="list-style-type: none"> Bio Marigold Lutein Extract Jelly Sleep Powder for kids Bone Growth Drink for kids Vitamin QQ Jelly for kids Growth QQ Jelly for kids 	<ul style="list-style-type: none"> Lutein Drink Grape King Bio Kombucha Double Fiber Drink Aphrodisiac Drink Drainage and Sodium Removal Drink 	<ul style="list-style-type: none"> Sleep Capsules Calcium Powder Cellulite Reduction Capsules Clostridium Butyricum Capsules Aphrodisiac Capsules Weight Loss Probiotic NMN 		<ul style="list-style-type: none"> Cat (Health Powder) Dog (Health Powder) Dog (Eye Health Powder) 	<ul style="list-style-type: none"> Sensitive Skin Cleaning Products
New products developed in 2023	4	80	12	13	56	112	0	14	1

In 2023, Grape King Bio not only conducted routine product development processes, but also developed products along two main focuses: (1) Technical improvements for existing products (2) Proposals for new products and development of samples for new dosage forms

At the end of 2023, we held a new product achievement presentation, marking the first time the Innovation Research Center collaborated with the Marketing and Planning Department for product conceptualization and development. This integration allowed products to address both marketability and efficacy, catering better to the diverse needs of modern customers. The event received considerable feedback and praise, indicating potential for future iterations or enhancements of this collaborative model.

Our product developments are customized for client needs. If clients wish to develop products aligned with market needs, we fully collaborate with them on design and production. We currently do not prohibit use of GMO materials in our products, but select specific materials if requested to do so by our clients. With regard to documentation and certification, we provide raw material supplier inspection documents to prove that we used no GMO raw materials.

2. Cross-Industry Collaborations

We formed a strategic partnership with the Uni-President Group and expanded our domestic and overseas channels, officially bringing our healthy snack foods to the mass market. We utilized Uni-President's expertise in FMCG foods to refine our food safety structures and systems.

3. Online Channels

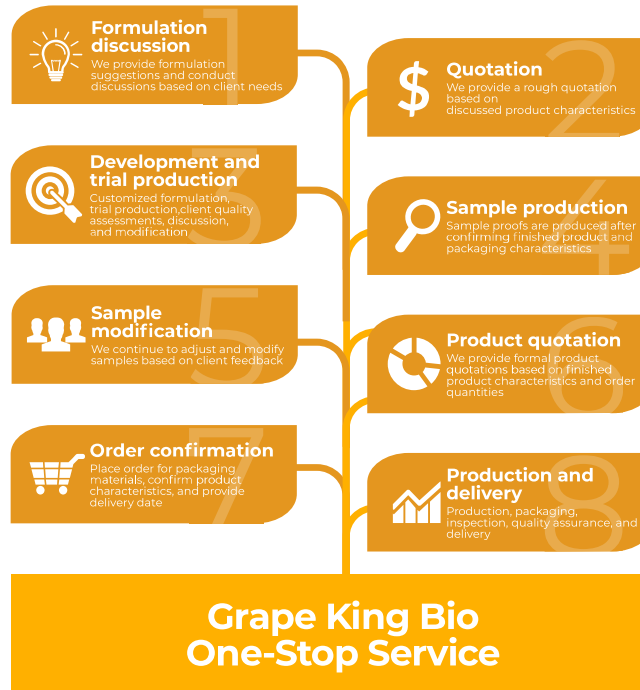
Our direct sales online platform provided contact-free shopping opportunities online during the pandemic. In future, we plan to provide comprehensive and professional health suggestions, gradually strengthen our relationship with our members, and work to become an all-round health care expert.

4. Customized Formulation Designs and OEM Services

Apart from developing our own products, our product development team provides comprehensive ODM/OEM services and can customize products and formulations to fit client requirements. We can provide tailored and innovative formulations in a wide range of dosage forms and supply customized and innovative products to our clients. Apart from domestic channels, we have also begun to actively develop overseas markets in recent years. Our ODM/OEM services provide a variety of product formulations and packaging, including glass bottles, PKL combibloc/aluminum drinks packaging, aluminum packaging (flake, powder, and granule), capsules, and pouches (liquid formulations and jelly drinks).

One-Stop Service Platform

Grape King Bio has established a one-stop service OEM platform which provides integrated services from importing of upstream patented raw materials, cross-category production lines, and back-end packaging of finished products. We provide OEM services for many products such as health foods, beauty drinks, functional drinks, and PKL aluminum foil-packaged beverages.



Professional Consulting Services

Our R&D team provide professional guidance on raw materials and products based on client market plans and product needs. We also provide our clients with timely after-sales consulting service such as guidance on product health and nutritional information and guidance on relevant documentation for client health food products.

3.2 Industry-Academia Collaborations

We work closely with schools. In terms of professional technologies, we have a long development history and advanced technologies, making us a key target for industry-academia collaborations. We continue to build connections and work on projects with schools, participate in various speeches and academic presentations, and also provide product testing services.

We possess a variety of fermentation technologies, and are one of the top industrial biotech sites for academic visits by students from related fields. We build links between theoretical knowledge and practical applications so students can apply what they have learned. Over the past three years, our factories have hosted 59 visits for 2,198 people. We hope our efforts can bridge industrial-academic technological gaps, develop innovative technologies, and cultivate key talents for the future.

1. Invested in industry-academia research collaborations, working with colleges and universities

Grape King Bio actively promotes industry-academia collaborations and links new products with professional research of professors from universities and colleges around Taiwan so as to enhance our R&D momentum, verify product efficacy, speed industrial upgrading, and accelerate commercialization and marketization of university research.



2. Obtained biotech industry projects

Grape King Bio has made great contributions in furthering development of the national biotechnology industry. The Executive Yuan Ministry of Economic Affairs guides the industry by accepting applications for several large-scale projects each year. Over the past ten years, Grape King Bio has applied for and completed a total of nine projects, working with many science and technology colleges to jointly develop many new products and conduct efficacy tests. Total investments amounted to NT\$146 million, and our projects have yielded fruitful results. In addition to supporting the Ministry of Education's talent training programs, we also provide internship opportunities and industry teachers who lecture and serve as visiting directors for various schools. We review various projects for the Ministry of Science and Technology, were invited to present speeches and serve as an evaluation committee member for the Ministry of Economic Affairs, actively supporting these governmental institutes and promoting industry-academia-government exchanges and collaborations.

We received a subsidy of NT\$11.2 million from the Technology Development Program by the Ministry of Economic Affairs, and our research focuses on the development of high-fiber, high-protein fungal-based meat alternative using mycoprotein produced by *Fusarium venenatum* PTA-2684. The research team has continuously striven for breakthroughs since acquiring the mycoprotein strain. In just a year and a half, we have successfully developed a formula and process for mass production, enabling the production of tons of mycoprotein within a mere 3 days of incubation and saving significant time and resources. This proves that our strain incubation capabilities and production technology are both the first of their kind in Taiwan.

In addition to collaborating with the Food Industry Research and Development Institute and the R&D team led by Distinguished Professor Li-Yun Lin in the Department of Food Science and Technology, Hungkuang University, we worked closely with Wei Yuan Co., Ltd. and Chien Yuan Food Technology Co., Ltd., both of which possess profound expertise in plant-based product development. Through the collaborative effort mentioned above, we leveraged professional food processing techniques and boundless creativity in exploring novel mycoprotein raw materials to develop numerous unique mycoprotein products, which subverted the traditional framework of alternative proteins. The diverse range of developed products include savory items such as popcorn

chicken, chicken nuggets, sausage, hot dogs, saliva chicken, meatballs, ham, truffle-flavored pasta sauce, pork cutlets, vegetarian pork belly, vegetarian marbled beef and vegetarian tuna canned goods, as well as dessert items such as pineapple cake, ice cream, soft serve and loaf bread.

We also utilized "mycoprotein combined with 3D printing technology," transforming ordinary mycoprotein raw materials into visually stunning creations that are not only aesthetically pleasing but also delicious, capturing everyone's attention.

Furthermore, we presented and promoted our R&D results for mycoprotein at various university conferences and international seminars, both domestically and internationally, all of which have received great responses and aroused much attention and interest.

In recent years, the issue of climate change has garnered global attention, and both governments and private sectors have strongly advocated for ESG (Environmental, Social, and Governance) principles. We are also committed to corporate sustainability and recognize the significance of global warming issues. With up to 14% of global greenhouse gas emissions caused by methane emissions from animal husbandry, the future trend in the global diet is expected to shift towards alternative proteins, namely mycoproteins to replace animal-based proteins to reduce global warming factors such as animal farming, greenhouse effect and population growth. With 30 years of extensive fermentation technology and experience, we fully integrate resources from industry, government, academia, and research institutes to jointly develop various types of diversified foods with wide applications through this research project. This aims to drive a new wave of mycoprotein utilization, thereby reducing greenhouse gas emissions and achieving an eco-friendly and healthy lifestyle.



3. Academic speeches and academic works

The R&D department at Grape King Bio has been invited to speak at industrial, government, and academic institutes. We have provided lectures at more than 100 college departments to share and exchange our more than 20 years of experiences relating to biotechnology and industry development. Over the past three years, we were invited to present 130 lectures at colleges and universities, participated in oral examinations of more than 100 graduate and doctoral dissertations, participated in curriculum planning or departmental development of more than 10 university departments, and evaluated more than 10 university departments. We also publish our research results in journals or at conferences. In 2023, we published 21 journal papers, 30 conference papers, and 28 conference posters. In 2023, we chaired the Taiwan Association for Lactic Acid Bacteria, and promoted research, information exchanges, and industrial applications relating to lactic acid bacteria.



4. Provided product testing services

We are renowned for our fermentation technologies, and have 80 fermentation tanks in our factories. Apart from supplying key raw materials, we also provide fermentation testing and commercial production platform services to external academic and industrial institutes, which enable us to study different microorganisms, strengthen our research, and build our expertise while assessing appropriate materials for technological transfers. We work with more than 20 college departments, accelerate industry-academia collaborations, and speed industrialization and mass production of academic achievements to enhance our international competitiveness.



3.3 Customer Service

General manager of
Business Division and
Shanghai subsidiary
Yuan-Tsung Lin



“

Customer service is an important element for building good relationships with customers. We listen to customer feedback and take action to improve our products and services.

”

Management Approach	Key issue-Customer service	
Policies	Use data analytics and data systems to support and complete personnel training so as to fulfill customer expectations, build customer loyalty through professional services, and enhance customer satisfaction as our customer numbers continue to grow.	
Commitments	Use our heartwarming services and clear procedures to offer customer service experiences that fulfill customer needs and solve customer problems.	
Targets	Short-term	<ul style="list-style-type: none"> Ensure service quality through customer interviews and satisfaction surveys following phone support, and include these items in evaluation system to smooth service processes. Conduct product refresher training courses led by professional nutritionists to enhance product knowledge. Compile frequently asked customer questions and establish a database to ensure consistency and accuracy of service quality. Implement a comprehensive customer call management service solution to improve service quality and response efficiency of phone support.
	Mid-term	<ul style="list-style-type: none"> Established a new customer data platform (CDP) database to analyze, track, and manage customer interactions, integrating data from all sources to greatly strengthen marketing efficiency and customer service, achieving personalized communication, facilitating effective understanding of consumer needs, and providing timely marketing solutions which allow us to take advantage of consumer interaction opportunities and manage service quality. Ensure smooth service processes and service quality using satisfaction surveys to regularly assess relevant indicators. Our goal is to increase “complete satisfaction” rates. Our customer service staff participate in training organized by professional institutes each year and obtain related certificates. Establish standard operating procedures and categorization systems for customer complaints to enhance efficiency of crisis management. Enhance service value and establish connections with consumers through handwritten birthday letters or calls from nutritionists to establish trust and help consumers feel that they are valued.
	Long-term	<ul style="list-style-type: none"> Establish a complete customer service and nutritionist team to respond to customer service queries and provide comprehensive health, diet, and lifestyle recommendations.
Responsibilities	Related internal collaboration units: Legal Office, Quality Assurance Department, Marketing Section, and Finished Products Section.	
Resources	Invested in personnel training courses (including external customer service training courses and internal product refresher courses) and use our CRM and CTI systems for customer management and management of support quality. Our systems allow us to compile comprehensive records on customer journeys, customer contacts, and product quality, thereby allowing us to improve customer service experiences and satisfaction.	
Specific performance	<ul style="list-style-type: none"> ✓ Upon the launch of CTI system for 2 years, continuously optimized the service quality of customer calls, including reviewing busy periods to avoid excessive wait times for calls, expanding participation rates in customer satisfaction surveys, tracking dissatisfied customer service issues, continuous improvement and so on; effectively decreased complaints from customer calls in 2023; reduced the waiting time and enhanced satisfaction rates significantly. ✓ Launched the customer complaint management system related to quality management upon the implementation of the SAP system in 2023. From the receipt of complaints and quality control inspections to the production of reports for customer responses, all processes were changed to be established in the system, enabling every personnel involved in our processes to effectively understand issues related to progress and quality, thereby reducing similar types of complaints and allowing customer service personnel to respond more efficiently to customer needs. ✓ 2 customer service personnel continually obtained professional customer service certifications in 2023. ✓ Continued to update our database of frequently asked questions to include professional responses to customer complaints related to quality management. ✓ Conducted product refresher training courses led by professional nutritionists to enhance the professionalism of customer service personnel. 	



3.3.1 Innovative Marketing Strategies

In 2023, Taiwan has gradually lifted its lockdown measures, and consumers have become increasingly focused on health food. While not experiencing explosive growth in health food during the pandemic, there has been a steady increase. Grape King Bio has taken on the role of “A health expert for the entire family” and continually offers a full range of health products to provide comprehensive care for the public. The current era and growing public awareness of health have resulted in 7.9% growth for our private label brands.

1. Novel slimming products as the market leader

Launched at the end of 2022, the product “Slim Probiotics King capsules” has obtained national certification for its prevention of body fat formulation. Officially released across all channels in 2023, it was promoted through various channels including advertisements of our brand ambassador Lulu, numerous entertainers, Key Opinion Leaders (KOLs), Key Opinion Consumers (KOCs), and renowned YouTuber Shao-Wen Guan along with self-organized body fat competitions. Our Slim Probiotics King capsules became the best-selling product of 2023 for Grape King Bio and its revenues exceeded NT\$1.5 billion.

2. PowerBOMB power for midnight night energy

Due to the flagship product of Grape King Bio PowerBOMB targeting the population aged 18-30 years, we invited SHOU from the popular boyband WOLF(S) to act as our brand ambassador in the fourth quarter of 2022. In 2023, SHOU released a brand new single “PowerBOMB.” Apart from sponsoring his concert titled “PowerBOMB SHANG ZHANG,” we designed two limited edition packaging options for him.

Additionally, we co-branded with renowned chicken cutlet stores including “Monga Fried Chicken” and “Friedtheway” for midnight snacks, mainly targeting the young generation market. Therefore, PowerBOMB achieved double-digit growth for two consecutive years from 2022 to 2023 and garnered the interest of the younger generation. According to the IBUZZ voice of customers monitoring system, PowerBOMB generated significant buzz on social media and forums, surpassing the top three competitors in the market.

3. Co-branding to dominate the market

Since its launch in 2021 until now, our Kombucha Double Fiber Drink has been selected as the top favorite functional tea by netizens on the “DailyView” website. In 2023, this product was also placed in Netflix's hit Taiwanese drama “Wave Makers,” MyVideo's champion dramas “Best Interests 2 and 3,” and “Love Yourself” to continue generating buzz. In the fourth quarter, riding the wave of Disney's 100th Anniversary Celebration, we launched four limited edition collectible packaging and conducted co-brand marketing activities to maintain its position as Taiwan's most popular Kombucha leading brand. This product achieved revenue exceeding a billion.

4. OEM marketing and local execution

Apart from continuously promoting our two major raw material brands including GK Probiotics and GK Funggi, Grape King Bio created a new account on LinkedIn as a business development platform. Through this platform, we engage in various OEM services, exclusive materials, patents, nutritional knowledge, and interactions with potential customers. Within just six months, our fan count has grown to 1,005, with higher reach rates compared to competitors, securing the first position.

Grape King Bio helps customers build a better future using our core mission of “Technology, Health, Hope” Our customer service management targets for 2022 were divided into two main categories:

1. Establish a customer-oriented business philosophy: Move from product management to customer management, and from transaction management to relationship management. Customer needs, purchasing behaviors, and potential consumption preferences are all precious resources. Therefore, we actively collect comprehensive data from our interactions with consumers to build the core functions required for customer management, and continue to review customer satisfaction indicators and optimize our business processes. Our quantitative and qualitative customer interviews help us to collect customer feedback, which we use to make adjustments.

2. Accelerate customer service innovations: We adopt a customer-oriented service concept which not only focuses on customer satisfaction and loyalty enhancement, but also responds to changes in customer needs, including through an increasing number of LINE groups, online responses, and communication management. We continue to incorporate new systems and new service functions to facilitate ease of use and convenient communication and interaction with our customers.



Picture of 2023 Product Education Training



Investment highlights for 2023 :

We now have more than 160,000 members and continue to enhance customer satisfaction over four aspects, including by hiring professional nurses and nutritionists and by continually organizing product training hosted by nutritionists to enhance our professionalism and quality. We also established standard operating procedures in response to customer complaints, which made it possible for us to effectively categorize and manage customer complaints related to common quality issues, reduce the number of complaints and their escalation to serious problems, and enhance the professionalism of frontline customer service personnel. Additionally, our satisfaction surveys found that more than 90% of customers were satisfied with our services. For the few dissatisfied customers, we carefully listen to their phone feedback and discuss improvements based on their concerns.

In addition to effectively reducing the number of customer complaints in 2023 (a decrease of 13% in complaints from customer calls, totaling a reduction of over 2,000 calls annually), the number of people surveyed for satisfaction simultaneously increased (an increase of nearly 1,000 people surveyed for satisfaction in 2023). The satisfaction rate was also optimized (an increase of 5% in satisfaction levels in 2023). Furthermore, we continually established the customer data platform (CDP), integrating 360-degree customer data and relevant interest information to enhance understanding of customers and provide more comprehensive customer service.

Results of Customer Satisfaction Surveys

Category	2021	2022	2023
Satisfied	41%	60%	72%
Acceptable	51%	34%	27%
Not Satisfied	7%	5%	1%
Very Dissatisfied	1%	1%	0%
Very Satisfied	0%	0%	0%

Note 1 : Satisfaction and dissatisfaction inquiries were conducted for approximately 3144 incoming customer service clients in 2023, with satisfaction estimates based on these responses.

3.3.2 Customer Service Processes

Customer service handling processes at Grape King Bio is categorized as either general queries or customer complaints. We have established dedicated units to support the handling of customer service processes, ensuring that customer feedback can be delivered and resolved in a timely and comprehensive manner.

1. General queries : We provide product consultation services to offer immediate response to consumer queries.
2. Customer complaints : Customer complaints tend to be complex and require professional handling expertise as well as communication and verification of information between departments. In 2022, Grape King Bio adopted a policy to provide progress reports within 4 hours and resolve complaint cases within 24 hours. For complaints involving tests or other complex services, responses are provided at an agreed-upon time. This process ensures that customer complaints can be handled in a timely manner.

Apart from adding a noon segment (12:00-1:00 PM) to our original hotline services so our customers can call in during noon breaks, we have added other customer complaint channels to provide real-time responses in line with the modern era of information technology. Our digital channels include email, Facebook messages, and LINE@ messages. Other responses were provided through general calls.

Responsible Unit	Consumer calls	Consumer service center	Sales & Marketing Division	Quality assurance/R&D	Responsible unit	Sales/finances	Distribution center
Responsible personnel		Customer service hotline personnel Professional nutritionists	Product managers Channel managers Channel personnel	Quality assurance contact Quality assurance inspector Quality assurance section chief	Reviewer Unit manager	Unit personnel	Unit personnel
Handling unit	Product queries Activity queries Product orders	Accept customer calls Record basic consumer information	Product ordering procedures			Invoice creation	Shipping
Items	Complaints and grievances	<div>1</div> Accept preliminary customer calls Record basic consumer information Register complaints Provide immediate resolutions to customer complaints					
		<div>2</div> Composition problems Appeals are filed when issues cannot be resolved	<div>3</div> Accept notifications Customer complaint system processes	<div>4</div> Receipt Quality inspections for customer complaints Confirm inspection details and resolutions	<div>5</div> Tracking of sample quality Tracking of complaints	<div>6</div> Returns and refunds Discounts	<div>7</div> Tallying/receipts and returns
Conclude cases		<div>13</div> Respond to consumers Close cases	<div>12</div> Respond to customer service personnel	<div>11</div> Investigation of administrative documents Verification form for quality abnormalities Investigation reports Respond to manager of business department	<div>10</div> Review incident context Formulate countermeasures Track improvements Confirm countermeasures Implementation results	<div>9</div> Notify unit personnel Notify sales units to rescind invoices	<div>8</div> Notify unit personnel at the first instance after receiving returned products



In 2023, the number of customer complaints we received decreased significantly. The primary complaints included issues related to logistics and delivery, as well as delays in receiving gifts, and the remaining complaints mostly related to suggestions regarding product use. This year, we continued to uphold our customer-first principles and maintain smooth communications using a professional and positive attitude to handle customer feedback to ensure that customer complaints can be effectively resolved. We also conduct internal reviews to reduce similar complaints in the future.

Due to increasing awareness of personal information protection measures, we are receiving more and more customer complaints related to personal information usage. We have optimized our standard operating procedures to simultaneously shut down personal information usage across multiple systems after our customers requested cessation of such usage. We have also added new settings to our digital newsletters so we can cease using personal information once permissions to use emails have been rejected. Meanwhile, we asked our customer service personnel to explain subsequent processes and required times to customers with relevant concerns, so that they would be aware of relevant processes and times, thereby effectively preventing repeated customer complaints in 2023.

Additionally, in terms of off-the-shelf products sold in large quantities through physical channels, common customer complaints related to product quality including spillage, clumping, and quantity shortage are recorded in the system and discussed by our quality control unit to identify potential problems and make improvement suggestions. For instance, we adopted new processes such as capsule counting and weighing to address the issue of capsules slipping out due to rapid bottling during the automatic packaging and sealing process. We thoroughly considered consumer feedback and suggestions, prioritized customer service satisfaction, and provided better complaint handling in response.

3.3.3 Listening to Customer Opinions

Our short-to-medium term service policies are as follows:

- 1.Strengthen customer service skills, training, and professional certifications
- 2.Review all points of contact, including by establishing standard procedures for categorizing customer complaints and a database of common customer complaints. We have implemented comprehensive satisfaction surveys and will continue to improve customer interactions by establishing a professional and sound customer management team over the long term, as well as use data analytics and a professional nutrition team to provide better customer value in our customer management system.
- 3.To establish a professional and comprehensive customer management team in the long term, we aim to provide a sophisticated "customer value" management system through comprehensive data analysis and a professional nutrition team.

We observed that our customers no longer differentiate between physical and virtual channels as they utilize multiple channels freely. Therefore, understanding customer characteristics and common problems faced by customers of physical channels may help to enhance our customer service quality. Additionally, social media marketing is still one of our main axes in the post-pandemic era. Compared to the saturation of information provided by mainstream media, consumers are more receptive to highly interactive and interesting advertisements on social media. Therefore, we plan to reimagine customer processes to increase flexibility and create new shopping experiences.



3.3.4 Protection of Customer Privacy and Rights



Division director of
Management Division
Du-Sheng Wang

“

We will incorporate information security management mechanisms into the operating procedures of all departments and appropriately manage intellectual products generated by employees as well as confidential corporate information to establish a solid foundation for growth at Grape King Bio.

”

We protect the personal information of our customers and safeguard customer interests using the highest standards. In 2023, our ISO/IEC 27001:2013 certification continued to be valid and we have established an Information Security and Personal Information Management Committee. Our Chairman serves as the highest authority for the Committee, and senior executives from each department serve as committee members.

We have also established the following information security policies :

1	Information security is a key factor for achieving our operational targets. We need to maintain high levels of information security to ensure the confidentiality, integrity, and accessibility.
2	We strive to maintain consistency of information security measures in our operating environments while also balancing account security and information sharing.
3	Our information security management regulations are required to comply with governmental information security laws, regulations, and policy requirements.
4	All information procedures must ensure the security of corporate information to prevent leakage or loss of sensitive and confidential information.
5	We protect our information assets (including software, hardware, network communication facilities, and databases) and adopt appropriate backup and recovery facilities and procedures to prevent damage to information assets that could be caused by unauthorized actions or negligence. We also conduct periodic backup and recovery drills.
6	We have adopted appropriate information security management measures for all of our projects to ensure that related information is well-protected.
7	We conduct regular information security training to strengthen promotion of related policies.

No complaints concerning breaches of customer privacy and losses of customer data occurred in 2023. Other protection measures include the following :

1. Permission for use of personal information for our Grape King online store was upgraded so that all customers have to agree to relevant permissions before we can use their personal information. We use the most rigorous means to ensure that our customers can agree to and understand the regulations for subsequent use of personal information.
2. We prohibit our internal personnel from attaching files containing personal information to emails and instead apply restrictions on file access so that only authorized personnel can access folders containing personal information so as to strictly control the flow of personal information within our company.
3. We periodically change account information and passwords to improve login and access security.

