TIANGEN®

TGuide Smart Processed Food DNA Kit

(Prefilled single sample cartridge)

For extraction of genomic DNA from processed foods, including soybean powder, potato chips, starch, honey, and dried meat.

TECHNICAL MANUAL

Cat. no. GDP680-DE

Note: To use the TGuide Smart Processed Food DNA Kit, you must have the TGuide Smart Processed Food DNA Kit (program no. DP680) installed on the TGuide S16/S32/S32 Pro/S96 Dex Nucleic Acid Extractor.

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For research use only. Not for use in diagnostic procedures.

Table Contents

TGuide Smart Processed Food DNA Kit

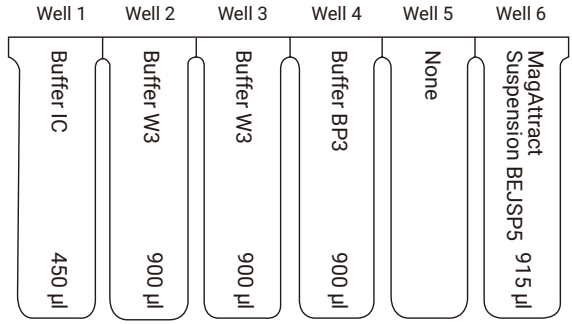
Cat. no. GDP680-DE

Kit Contents

	Contents	GDP680-DE (48 preps)
GDP680-DH	Buffer GHA	40 ml
	Buffer GHL	20 ml
	NKY tablets	2 tablets
	Processed Food DNA Reagents	48 pcs
	Proteinase K	1 ml
	RNaseA (100 mg/ml)	200 μl
	Buffer TBC	15 ml
OSE-TGA-S36	TGuide Smart Tip Comb	12 pcs

Note: GDP680-DH and OSE-TGA-S36 are shipped and packaged separately.

Processed Food DNA Reagents Composition



Storage

Store at room temperature (15-30℃) in a dry environment. If precipitates form in any buffer, incubate the solution in a 37℃ water bath for 10 minutes to fully dissolve precipitates.

Introduction

Processed foods have complex compositions, containing not only multiple raw material components but also various food additives (such as salt, sugar, oils, and pigments). Furthermore, processing techniques such as frying, deep-frying, boiling, and roasting can cause varying degrees of DNA degradation in the raw materials. Conventional nucleic acid extraction methods are unable to simultaneously achieve high yield, purity, and scalable extraction.

This kit employs a magnetic bead and buffer system with unique separation properties to isolate high-quality genomic DNA from a wide range of processed foods, including soybean powder, potato chips, starch, honey, and dried meat. The specially embedded magnetic beads exhibit strong affinity for nucleic acids under specific conditions and release them upon condition change, enabling rapid purification. The procedure is safe and convenient, yielding DNA fragments with high yield, excellent purity, and reliable quality. The kit is compatible with TIANGEN's TGuide S16/S32/S32 Pro/S96 Dex systems for automated extraction.

DNA purified with this kit is suitable for various downstream assays, including PCR, real-time PCR, etc.

Features

Simple and fast: simple pretreatment; high-quality genomic DNA can be obtained within 1 hour after starting the instrument run.

Safe and non-toxic: no phenol/chloroform or other hazardous reagents required.

Broad applicability: suitable for genomic DNA extraction from various processed food samples, including soybean powder, potato chips, starch, honey, dried meat, etc.

High quality: the extracted DNA is of high quality and can be directly used in PCR, real-time PCR, and other assays.

Notes **Please read these notes carefully before using this kit.**

1. If precipitates appear in Buffer GHA, redissolve them in a 37°C water bath and mix well before use.
2. The NKY tablets provided in the kit are an optional addition. For samples with high pigment or inhibitor content, such as brown sugar, strawberry jam, tomato ketchup, hawthorn jelly, instant noodle sauce packets, and lotus root starch, it is recommended to add the NKY tablets.

   Two methods are available for using the NKY tablets; choose either one:

   Method 1: First add the NKY tablet to Buffer GHA, with 1 tablet per 20 ml of solution. Vortex for 2 min to disperse — it will appear as a white, insoluble turbid suspension. Mix thoroughly before adding the lysis buffer. Slight unevenness when dispensing into centrifuge tubes does not affect the results.

Method 2: Crush the NKY tablet and add approximately a mung bean-sized particle to each sample, then add Buffer GHA and proceed with the operating steps.

3. Pretreatment methods vary for different sample types. Please read the manual carefully before the experiment and prepare the required reagents.

Protocol

I. Preparation of Processed Food DNA Extraction Reagents

1.1 Remove the single-cartridge prefilled reagents from the kit. Invert several times to resuspend the magnetic beads. Flick the strip gently to collect all reagents and beads at the bottom of the wells. Carefully remove the sealing film before use. Avoid vibration to prevent liquid splashing.

1.2 Add appropriate volume (60-100 μl) of elution Buffer TBC to well 5 before starting the run.

II. Sample Pretreatment

Refer to the table below for the recommended sample amount of different sample types:

Sample Classification	Recommended Sample Amount	Sample Name
soy milk powder, milk powder, flour, and starch	50-100 mg	soybean meal, soy milk powder, milk powder, sesame paste, starch, lotus root starch, vermicelli, rice noodles
		biscuits, bread, fried dough twist, senbei, snow rice cake, instant noodle cake, crispy rice crust
meat, seafood, processed fruits and vegetables, sugar, and pet food	50-100 mg	diced pork, dried pork slice, dried small shrimp, deep-sea dried fish, fish tofu, shredded squid, duck blood curd, sausage
		raisins, dried figs, instant noodle vegetable packet, pickled vegetables, potato chips, corn flakes, dried banana chips, oatmeal, konjac snack, dried tofu, cheese, butter
		marshmallow, crispy candy, White Rabbit creamy candy, chocolate, milk tablet
		cat food, cat treats
meat sauce, tomato ketchup, and yogurt	100-200 mg	salad dressing, mushroom sauce, instant noodle sauce packet, fermented bean curd, bean paste
soy milk, milk, fruit juice, and honey	1-10 ml	soy milk, milk, yogurt, concentrated fruit juice, honey

Refer to the following procedure for sample pretreatment:

1. Soy Milk Powder, Milk Powder, Flour, and Starch

1) Place 50-100 mg of sample into a grinding tube (user-provided; TIANGEN, Cat. no. OSE-TH-B05) or a steel bead grinding tube (user-provided; TIANGEN, Cat. no. OSE-TH-B04). Add 700 µl of Buffer GHA, 300 µl of Buffer GHL, and 20 µl of Proteinase K. Use a thermostatic shaking metal bath (user-provided; TIANGEN, Cat. no. OSE-DB-03) and digest at 65°C while shaking for 30 min.

   Note:

   a. The amount of Buffer GHA can be adjusted according to the sample's water absorbency.

   b. For samples that are difficult to homogenize, such as vermicelli and brown rice, grind and mix using a TGrinder H24 Tissue Homogenizer (user-provided; TIANGEN, Cat. no. OSE-TH-01) before adding Buffer GHA (vibrate at 6 m/s for 30 sec, with a 30 sec interval, for 3-9 cycles).

   c. For starch and vermicelli samples, the addition of lysis buffer may result in a jelly-like consistency. It is recommended to add 4 µl of TR Amylase (user-provided; TIANGEN, Cat. no. GRT404-01) to aid digestion.

2) After cooling to room temperature, add 4 µl RNaseA (100 mg/ml), vortex to mix, and incubate at room temperature for 10 min.

3) Centrifuge at 13,400 rpm (~17,000×g) for 5 min and add no more than 500 µl of the digested solution to Well 1 of the single sample reagent cartridge for automated extraction.

2. Meat, Seafood, Processed Fruits and Vegetables, Sugar, and Pet Food

1) Flash-freeze 50-100 mg of sample in liquid nitrogen and place it into a grinding tube (user-provided; TIANGEN, Cat. no. OSE-TH-C01 or OSE-TH-C02) or a steel bead grinding tube (user-provided; TIANGEN, Cat. no. OSE-TH-B04). Use a TGrinder H24 Tissue Homogenizer (user-provided; TIANGEN, Cat. no. OSE-TH-01) to grind and mix (vibrate at 6 m/s for 30 sec, with a 30 sec interval, for 3-9 cycles). Then add 700 µl of Buffer GHA, 300 µl of Buffer GHL, and 20 µl of Proteinase K, and place in a thermostatic shaking metal bath (user-provided; TIANGEN, Cat. no. OSE-DB-03) and digest at 65°C while shaking for 30 min.

   Note: For samples that are difficult to homogenize, such as certain dried meat products, increase the homogenization cycles until the sample is ground to a powder, or extend the 65°C digestion time until no visible tissue clumps remain.

2) After cooling to room temperature, add 4 µl RNaseA (100 mg/ml), vortex to mix, and incubate at room temperature for 10 min.

3) Centrifuge at 13,400 rpm (~17,000×g) for 5 min and add no more than 500 µl of the digested solution to Well 1 of the single sample reagent cartridge for

automated extraction.

3. Meat Sauce, Tomato Ketchup, and Yogurt

1) Take 100-200 mg of sample, add 700 µl of Buffer GHA, 300 µl of Buffer GHL, and 20 µl of Proteinase K, then place in a thermostatic shaking metal bath (user-provided; TIANGEN, Cat. no. OSE-DB-03) and digest at 65°C while shaking for 30 min. If visible clumps are present, transfer to a grinding tube (user-provided; TIANGEN, Cat. no. OSE-TH-C02 or OSE-TH-C03) or a steel bead grinding tube (user-provided; TIANGEN, Cat. no. OSE-TH-B04), use a TGrinder H24 Tissue Homogenizer (user-provided; TIANGEN, Cat. no. OSE-TH-01) to grind and mix (vibrate at 6 m/s for 30 sec, with a 30 sec interval, for 6-9 cycles), then add 700 µl of Buffer GHA, 300 µl of Buffer GHL, and 20 µl of Proteinase K, and place in a thermostatic shaking metal bath and digest at 65°C while shaking for 30 min. If no visible clumps are present, the sample may also be added directly to a grinding tube (user-provided; TIANGEN, Cat. no. OSE-TH-B05), which facilitates nucleic acid extraction from microorganisms present in the sample.

   Note: The water content of different samples may vary slightly. Centrifugation may be performed as needed. For example, a 200 mg yogurt sample can be centrifuged at 5,000×g for 10 min, and the supernatant discarded before proceeding with subsequent processing.

2) After cooling to room temperature, add 4 µl RNaseA (100 mg/ml), vortex to mix, and incubate at room temperature for 10 min.

3) Centrifuge at 13,400 rpm (~17,000×g) for 5 min and add no more than 500 µl of the digested solution to Well 1 of the single sample reagent cartridge for automated extraction.

4. Soy Milk, Milk, Fruit Juice, and Honey

1) Take 1-10 ml of sample, centrifuge at 12,000 rpm for 2 min, retain the pellet and 200 µl of supernatant. Add 300 µl of Buffer GHA, 300 µl of Buffer GHL, and 20 µl of Proteinase K, then place in a thermostatic shaking metal bath (user-provided; TIANGEN, Cat. no. OSE-DB-03) and digest at 65°C while shaking for 30 min.

   Note: Due to differences in concentration and content among samples, the volume may be adjusted accordingly. For example, concentrated fruit juice may require approximately 1 ml, while relatively clear juice may require about 10 ml.

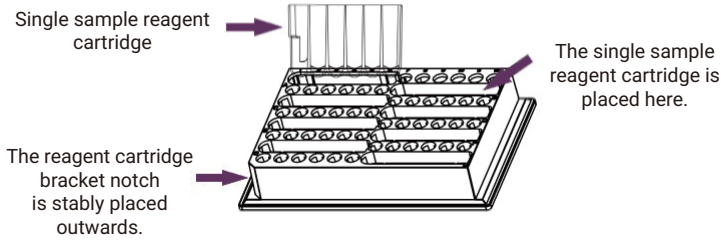
2) After cooling to room temperature, add 4 µl RNaseA (100 mg/ml), vortex to mix, and incubate at room temperature for 10 min.

3) Centrifuge at 13,400 rpm (~17,000×g) for 5 min and add no more than 500 µl of the digested solution to Well 1 of the single sample reagent cartridge for automated extraction.

III. Operation Steps for TGuide S16/S32/S32 Pro/S96 Dex Nucleic Acid Extractor

1. Add no more than 500 μl of the digested solution to Well 1 of the single sample reagent cartridge and place the single sample reagent cartridge onto the dedicated single sample reagent cartridge holder.

2. Mount the single sample reagent cartridge holder onto the base platform inside TGuide S16/S32/S32 Pro/S96 Dex instrument; insert tip combs into corresponding comb rack slots and fully lock the buckles in place.



3. Select the corresponding program and press the Start button to initiate the extraction protocol.

The automated extraction program for processed food DNA is shown in the table below:

Table 1 TGuide S16 Automated Nucleic Acid Extractor — Automated Extraction Program for Processed Food DNA

Step	Slot	Name	Mixing Time (min)	Mixing speed	Air-Drying Time (min)	Volume (μl)	Temp. (°C)	Magnetic Attraction Segments	Magnetic Attraction Time Per Segment (sec)	Liquid Surface Magnetic Attraction Time (sec)	Cycle Number	Magnetic Attraction Speed (mm/s)
1	6	Transfer Beads	0	8	--	930	--	5	5	0	2	2.5
2	2	Store Beads	1	8	--	900	--	1	0	0	1	2.5
3	1	Binding	1	8	--	900	--	1	0	0	1	2.5
4	2	Transfer Beads	0	8	--	930	--	5	5	0	2	2.5
5	1	Binding	3	8	--	900	--	1	0	0	1	2.5
6	1	Binding	5	5	--	900	--	3	20	10	1	2.5
7	2	Wash 1	0.5	8	--	100	--	1	0	0	1	2.5
8	2	Wash 2	4	8	--	900	--	5	5	0	2	2.5
9	3	Wash 3	0.5	8	--	100	--	1	0	0	1	2.5
10	3	Wash 4	4	8	--	900	--	5	5	0	2	2.5
11	4	Wash 5	3	8	--	900	--	5	5	0	2	2.5
12	6	Wash 6	3	6	8	900	--	3	20	0	1	2.5
13	5	Elution	8	8	--	120	75	5	12	0	3	2.5
14	6	Discard Beads	0.5	8	--	300	--	1	0	0	1	2.5

Table 2: TGuide S32/S32 Pro Automated Nucleic Acid Extractor — Automated Extraction Program for Processed Food DNA

Step	Slot	Name	Waiting time (min)	Mixing time (min)	Magnetic Attraction time (min)	Mixing Speed	Volume (μl)	Temper-ature (°C)	Cycle Mode
1	6	Transfer Beads	0	0	1	Fast	930	--	Cycle
2	2	Store Beads	0	1	0	Fast	900	--	--
3	1	Binding	0	1	0	Fast	900	--	--
4	2	Transfer Beads	0	0	1	Fast	930	--	Cycle
5	1	Binding	0	3	1	Fast	900	--	Cycle
6	1	Binding	0	5	2	Slow	900	--	Cycle
7	2	Wash 1	0	0.5	1	Fast	100	--	Cycle
8	2	Wash 2	0	4	1	Fast	900	--	Cycle
9	3	Wash 3	0	0.5	1	Fast	100	--	Cycle
10	3	Wash 4	0	4	1	Fast	900	--	Cycle
11	4	Wash 5	0	3	1	Fast	900	--	Cycle
12	6	Wash 6	0	3	1	Slow	900	--	Cycle
13	5	Elution	8	8	3	Fast	120	75	Cycle
14	6	Discard Beads	0	0.5	0	Fast	300	--	--

Table 3: TGuide S96 Dex Automated Nucleic Acid Extractor — Automated Extraction Program for Processed Food DNA

Step	Well position	Name	Pre-Mixing Waiting Time (mm:ss)	Mixing Speed	Mixing Time (mm:ss)	Mixing Mode	Liquid Volume (μl)	Magnetic Attraction time (mm:ss)	Magnetic Attraction Count	Heating Temperature (°C)	Pause After Completion
1	6	Transfer Beads	--	Fast	0:30	Normal Mode	930	0:30	2	--	--
2	2	Store Beads	--	Fast	0:30	Normal Mode	900	0:00	0	--	--
3	1	Binding	--	Fast	1:00	Normal Mode	900	0:00	0	--	--
4	2	Transfer Beads	--	Fast	0:30	Normal Mode	930	0:30	2	--	--
5	1	Binding	--	Fast	3:00	Normal Mode	900	0:30	0	--	--
6	1	Binding	--	Fast	5:00	Normal Mode	900	0:30	2	--	--
7	2	Wash 1	--	Fast	0:30	Normal Mode	100	0:30	0	--	--
8	2	Wash 2	--	Fast	4:00	Normal Mode	900	0:30	2	--	--
9	3	Wash 3	--	Fast	0:30	Normal Mode	100	0:30	0	--	--
10	3	Wash 4	--	Fast	4:00	Normal Mode	900	0:30	2	--	--
11	4	Wash 5	--	Fast	3:00	Normal Mode	900	0:30	2	--	--
12	6	Wash 6	--	Fast	3:00	Normal Mode	900	0:30	2	--	--
13	5	Elution	8:00	Fast	8:00	Normal Mode	120	0:30	3	75	--
14	6	Discard Beads	--	Fast	0:30	Normal Mode	300	0	0	--	--

4. After completion of the automated extraction procedure, collect DNA from well 5 of the single-sample cartridge and store under appropriate conditions.

Appendix

Related Products

1. Instrument and Accessories

Product name	Packing Size	Cat.No
TGuide S16 Nucleic Acid Extractor	1 set	OSE-S16-AM
TGuide Smart Magnetic Tip Comb	200 pieces/box	OSE-TGA-S03
TGuide Single Sample Tank Bracket	5 pieces/box	OSE-TGA-S32

2. TGuide Smart Reagents Kits

Product name	Cartridge	Cat.No
TGuide Smart Viral DNA/RNA Kit	48 preps	GDP604-DE
TGuide Smart Universal DNA Kit	48 preps	GDP605-DE
TGuide Smart Envir-DNA Kit	48 preps	GDP613-DE
TGuide Smart Hi-Plant DNA Kit	48 preps	GDP617-DE
TGuide Smart DNA Purification Kit	48 preps	GDP642-DE
TGuide Smart Micro Cell Total RNA Kit	48 preps	GDP670-DE
TGuide Smart Universal RNA Kit	48 preps	GDP671-DE
TGuide Smart Hi-Plant RNA Kit	48 preps	GDP672-DE
TGuide Smart Processed Food DNA Kit	48 preps	GDP680-DE
TGuide Smart Viral DNA/RNA Kit	96 preps	GDP604-E
TGuide Smart Universal DNA Kit	96 preps	GDP605-E
TGuide Smart Envir-DNA Kit	96 preps	GDP613-E
TGuide Smart Hi-Plant DNA Kit	96 preps	GDP617-E
TGuide Smart DNA Purification Kit	96 preps	GDP642-E
TGuide Smart Micro Cell Total RNA Kit	96 preps	GDP670-E
TGuide Smart Universal RNA Kit	96 preps	GDP671-E
TGuide Smart Hi-Plant RNA Kit	96 preps	GDP672-E
TGuide Smart Processed Food DNA Kit	96 preps	GDP680-E