Sucrose-Glucose-Fructose Content Kit

Cat. No. KITG-048 **Lot. No.** (See product label)

SPECIFICATION

Product Overview	The Sucrose-Glucose-Fructose Content Kit is designed for the quantitative determination of sucrose, glucose, and fructose content in various samples. The kit utilizes enzymatic reactions involving hexokinase and specific enzymatic complexes to convert sucrose and fructose to glucose, and subsequently measures NADPH production at 340 nm via UV spectrophotometry. The assay is based on the principle that sucrose and fructose are converted to glucose under the action of specific enzymes, and glucose is then phosphorylated by hexokinase enzyme complex, simultaneously reducing NADP+ to NADPH. The increase in NADPH at 340 nm is measured to calculate the content of sucrose, glucose, and fructose, respectively.
Description	This Sucrose-Glucose-Fructose Content Kit provides a convenient and reliable enzymatic method for simultaneous determination of sucrose, glucose, and fructose content based on NADPH generation measured by UV spectrophotometry at 340 nm. Sucrose, glucose, and fructose are commonly found in most plants, fruits, and foods. Under the action of specific enzymes, sucrose and fructose are converted to glucose. Glucose is then phosphorylated by the hexokinase enzyme complex, simultaneously reducing NADP+ to NADPH. By measuring the increase in NADPH at 340 nm, the contents of sucrose, glucose, and fructose can be calculated separately. The kit is suitable for plant tissues, fruits, food products, and liquid samples, and can accommodate 48 assays per kit.
Form	Liquid and Lyophilized Powder
Applications	Quantitative determination of sucrose, glucose, and fructose content in plant tissues

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA

	and extracts; Quantitative determination of sucrose, glucose, and fructose content in fruits and fruit products; Quantitative determination of sucrose, glucose, and fructose content in food and beverage samples; Quantitative determination of sucrose, glucose, and fructose content in biological samples; Quantitative determination of sucrose, glucose, and fructose content in agricultural products
Notes	This kit is for research use only and not for use in diagnostic or therapeutic procedures. It is recommended to select 2 samples for pre-testing before formal experiments to understand the sample characteristics and familiarize with the experimental workflow, avoiding waste of samples and reagents. For tissue samples: Weigh approximately 0.1 g of tissue (0.5 g for samples with high water content), add 1 mL distilled water, and homogenize on ice. Dilution factor D: For samples with high sugar content (e.g., fruits), dilute 20-40 fold; for leaf samples, dilute 2-5 fold. If the supernatant after centrifugation is turbid (e.g., high-fat or high-protein samples such as animal tissues), transfer the supernatant to a new EP tube and centrifuge again, or incubate at 95°C for 5-10 min followed by centrifugation to collect the supernatant. For liquid samples: Approximately neutral clear liquid samples can be tested directly. Acidic samples should be adjusted to pH ~7.4 with NaOH (2 M), then incubated at room temperature for 30 min, and the clear supernatant can be tested directly. Reagent 2 and Reagent 3 can be prepared as a mixed solution at a ratio of 25:600 or 25:625 (add 625 µL or 650 µL of the mixed solution per well). Prepare fresh and use immediately. To reduce operational errors, it is recommended to use a multichannel pipette. This operational workflow is suitable for most routine sample testing. Experimental conditions can be appropriately adjusted according to actual sample status. For special sample types, technical support can provide customized optimization recommendations. Handle with care. Avoid contact with skin and eyes. Wear appropriate protective equipment when handling reagents. The kit is stable for at least 6 months when stored under recommended conditions. Avoid repeated freeze-thaw cycles for lyophilized reagents. Reconstituted reagents should be used promptly or aliquoted and stored at -20°C.

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA

Storage	Reagent 1: 4°C; Reagent 2: -20°C (lyophilized powder); Reagent 3: 4°C; Reagent 4: -20°C (lyophilized powder); Reagent 5: -20°C (liquid). Stable for at least 6 months.
Shipping	Shipped on dry ice or with ice packs depending on reagent storage requirements.
Reconstitution	Reagent 2 (lyophilized powder): Centrifuge briefly or tap the tube to collect the powder at the bottom, then add 2.6 mL distilled water to dissolve before use. Reagent 4 (lyophilized powder): Centrifuge briefly or tap the tube to collect the powder at the bottom, then add 2.6 mL distilled water to dissolve before use. Can be aliquoted and stored at -20°C, avoid repeated freeze-thaw cycles. Reagent 5 (liquid): Centrifuge briefly or tap the tube to collect the liquid at the bottom, then add 1.4 mL distilled water to dissolve before use. Can be aliquoted and stored at -20°C, avoid repeated freeze-thaw cycles.
Reaction conditions	Method: UV Spectrophotometry Wavelength: 340 nm Reaction temperature: 30°C water bath Format: 48 assays per kit Cuvette: 1 mL quartz cuvettes (path length 1 cm) Preheating time: >30 min Pre-incubation: 5 min First reaction: 30 min Second reaction: 20 min Total assay time per sample: approximately 55 min (excluding preheating and preparation time)
Usage	Kit Components: Reagent 1: 1.3 mL × 1 vial (Store at 4°C; can be aliquoted and frozen, avoid repeated freeze-thaw cycles) Reagent 2: Lyophilized powder × 1 vial (Store at -20°C; centrifuge briefly before use, add 2.6 mL distilled water to dissolve) Reagent 3: 65 mL liquid × 1 bottle (Store at 4°C) Reagent 4: Lyophilized powder × 1 vial (Store at -20°C; centrifuge briefly before use, add 2.6 mL distilled water to dissolve; can be aliquoted and frozen, avoid repeated freeze-thaw cycles) Reagent 5: Liquid, 1 mL × 1 vial (Store at -20°C; centrifuge briefly before use, add 1.4 mL distilled water to dissolve; can be aliquoted and frozen, avoid repeated freeze-thaw cycles) Materials Required but Not Supplied: UV spectrophotometer 1 mL quartz cuvettes (path length 1 cm) Centrifuge Water bath Adjustable pipettes Mortar and pestle Ice

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA

Distilled water NaOH (2 M) for pH adjustment of acidic samples Sample Preparation: 1. Tissue Samples: Weigh approximately 0.1 g of tissue (0.5 g for samples with high water content), add 1 mL distilled water, and homogenize on ice. Centrifuge at 12,000 rpm for 10 min at room temperature. Collect the supernatant and keep on ice for testing. Select appropriate dilution factor D based on sugar content (fruits: 20-40 fold; leaves: 2-5 fold). 2. Liquid Samples: Approximately neutral clear liquid samples can be tested directly. Acidic samples should be adjusted to pH ~7.4 with NaOH (2 M), then incubated at room temperature for 30 min. The clear supernatant can be tested directly. Select appropriate dilution factor D for testing. Assay Protocol: 1. Preheat UV spectrophotometer for >30 min, set wavelength to 340 nm, zero with distilled water. 2. Thaw all reagents or incubate in 30°C water bath for 15-30 min. 3. Prepare Reagent 2 + Reagent 3 mixed solution at ratio 25:600 or 25:625 (625 µL or 650 µL per well). Prepare fresh. 4. Add the following to 1 mL quartz cuvettes (path length 1 cm): For Glucose Measurement (Tube M and Control M): • Sample: 25 µL • Reagent 1: 25 µL • Reagent 2: 25 µL • Reagent 3: 600 µL (Tube M) or 625 µL (Control M) Mix well, incubate 5 min, read A1 at 340 nm. • Reagent 4: 25 µL Mix well, react 30 min, read A2 at 340 nm (extend if absorbance continues to increase until stable within 2 min). For Fructose + Sucrose Measurement (Tube N and Control N): • Sample: 25 µL • Reagent 1: 25 µL • Reagent 2: 25 µL • Reagent 3: 625 µL (Tube N) or 650 µL (Control N) Mix well, incubate 5 min, read A1 at 340 nm. • Reagent 4: 25 µL Mix well, react 30 min, read A2 at 340 nm. • Reagent 5: 25 µL Mix well, react 20 min, read A3 at 340 nm (extend if absorbance continues to increase until stable within 2 min). Data Analysis: ΔA Glucose = (A2 - A1) of Tube N - (A2 - A1) of Control N ΔA Fructose = (A3 - A2) of Tube N - (A3 - A2) of Control N ΔA Sucrose = [(A2 - A1) of Tube M - (A2 - A1) of Control M] - ΔA Glucose 1. By sample weight (mg/g fresh weight): Glucose content = [ΔA Glucose ÷ (ε × d)] × V2 × 10^3 × 180.16 ÷ (V1 ÷ V × W) = 0.8 × ΔA Glucose ÷ W × D Fructose content = [ΔA Fructose ÷ (ε × d)] × V3 × 10^3 × 180.16 ÷ (V1 ÷ V × W) = 0.83 × ΔA Fructose ÷ W × D Sucrose content = [ΔA Sucrose ÷ (ε × d)] × V2 × 10^3 × 342.3 ÷ (V1 ÷ V × W) = 1.52 × ΔA Sucrose ÷ W × D 2. By volume

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA

	(mg/mL): Glucose content = [ΔA Glucose ÷ (ε × d)] × V2 × 10^3 × 180.16 ÷ V1 = 0.8 × ΔA Glucose × D Fructose content = [ΔA Fructose ÷ (ε × d)] × V3 × 10^3 × 180.16 ÷ V1 = 0.83 × ΔA Fructose × D Sucrose content = [ΔA Sucrose ÷ (ε × d)] × V2 × 10^3 × 342.3 ÷ V1 = 1.52 × ΔA Sucrose × D Where: ε = molar extinction coefficient of NADPH = 6.3 × 10^3 L/mol/cm d = path length = 1 cm V = extraction volume = 1 mL V1 = sample volume = 25 μL = 0.025 mL V2 = total reaction volume for glucose = 700 μL = 7 × 10^{-4} L V3 = total reaction volume for fructose = 725 μL = 7.25 × 10^{-4} L Glucose molecular weight = 180.16 Fructose molecular weight = 180.16 Sucrose molecular weight = 342.3 W = sample weight (g) D = dilution factor (D = 1 for undiluted samples)
Extinction Coefficient	6.3 × 10^3 L/mol/cm

Tel: 1-631-559-9269 1-516-512-3133
Email: info@creative-biomart.com Fax: 1-631-938-8127
45-1 Ramsey Road, Shirley, NY 11967, USA