

DrinkCheck® Drink Spike Test

Summary of analytical validation. Single-use colorimetric test strip for the detection of common drink-spiking substances in beverages.

Tested by independent laboratories in the United Kingdom, 2013 to 2024.

1 Purpose and Scope

This document summarises the analytical validation of the test strip technology used in the DrinkCheck® Drink Spike Test. It is intended for resellers, distribution partners, institutional purchasing departments and technical enquiries, and replaces the release of the full laboratory reports.

It is based on four test reports issued by independent laboratories in 2013, 2014 and 2024, all of which are held in full by Bormann Bioscience LLC. The testing was carried out by the laboratories named in section 2 and not by Bormann Bioscience LLC. This summary reproduces the findings documented there, including the limitations identified (section 7).

2 Overview of Testing

Subject	Laboratory	Period	Scope
Ketamine, efficacy	Clinical Trials Laboratory Services Ltd., London, conducted at Homerton University Hospital NHS Foundation Trust	Nov 2012 to Apr 2013	85 beverage samples, blinded and randomised
GHB, efficacy	Strathclyde Institute of Pharmacy & Biomedical Sciences, University of Strathclyde, Glasgow	2014	41 beverage types, initial pH 3 to 8
Ketamine, cocaine and scopolamine, re-verification and extension	Lucideon Limited, United Kingdom, accredited to ISO/IEC 17025:2017	2024	Concentration series in deionised water, ethanol:water 40:60 (v/v) and 100 % ethanol
GHB, stability re-verification	Lucideon Limited, United Kingdom, accredited to ISO/IEC 17025:2017	01 Aug 2024 to 07 Oct 2024	Sodium oxybate standards in ethanol:water 40:60 (v/v)

The 2024 testing was carried out in accordance with cGMP standards. Ethanol:water 40:60 (v/v) simulates high-alcohol spirits such as vodka, gin, rum and whiskey and was chosen because any degradation of the test formulation would have been detectable in this matrix.

3 GHB (Gamma-Hydroxybutyrate)

GHB detection is based on a buffered lacmoid preparation. The colour change from pale pink to grey and on to blue indicates the alkaline reaction of GHB. Because the method is pH dependent, the 2014 study recorded the initial pH of every beverage tested.

41 beverage types were tested at initial pH values from 3 to 8, covering spirits, beer, wine, liqueurs, juices, soft drinks and water, each at GHB concentrations from 0 to 12 mg/mL. The original unbuffered preparation produced strongly pH dependent and inconsistent results. Following the change to the buffered preparation, GHB was reliably detected in 36 of the 41 beverages from the lowest concentration tested, 3 mg/mL, and in sparkling wine from 4 mg/mL.

Detection range	3 to 12 mg/mL in the large majority of beverages tested
Sensitivity	95.12 % (39 of 41 beverages)
Specificity	95.12 % (39 of 41 beverages)
Overall accuracy	95.12 %
False negatives	Highly acidic beverages: bitter lemon and lime cordial, even at 12 mg/mL
False positives	Highly alkaline beverages: milk and cream liqueur (Bailey's)

For context on concentrations, reported GHB dosages are 0.5 to 1.0 g (light) and 1.0 to 2.5 g (common). The tested range of 3 to 12 mg/mL covers the quantities realistically used in drink spiking.

The 2024 re-verification by Lucideon was carried out to confirm formulation stability in a high-alcohol matrix. It used sodium oxybate standards from 10 to 250 mg/mL and confirmed the colour change within 30 seconds as well as the finding that ethanol:water 40:60 (v/v) does not interfere with the colour change. The lower concentration range relevant to drink spiking, 3 to 12 mg/mL, is evidenced by the 2014 study and not by the 2024 re-verification.

4 Ketamine

Detection of ketamine and other alkaloids uses a Dragendorff based reagent, which forms an orange-brown colour change with amines and basic heterocyclics.

The 2013 study was designed as a blinded comparative trial. Beverages were selected at random by an independent purveyor, anonymised and randomised, then tested in parallel with and without added ketamine. 85 samples were recorded across a wide range of alcoholic and non-alcoholic beverages with varying colour, sugar content and potential cross-reactants. The concentration series covered 0.625, 1.25, 2.5, 5 and 10 mg/mL, read after 30 seconds.

Detection range	0.625 to 10 mg/mL
Sensitivity	97.67 %
Specificity	100.00 %
Overall accuracy	98.84 %
False negatives	None recorded across the beverages tested
False positives	Dark red beverages such as red wine, blackcurrant, and blackberry and raspberry liqueurs, where a higher concentration is required for an unambiguous reading

5 Cocaine and Scopolamine

Cocaine and scopolamine were added to the detection range of the test strip in 2024 and tested by Lucideon. The report confirms the following detection ranges:

Substance	Matrix	Detection range	Time to result
Cocaine hydrochloride	Deionised water	0.625 to 10.0 mg/mL	30 to 60 seconds
Ketamine hydrochloride	Deionised water and ethanol:water 40:60 (v/v)	1.25 to 10.0 mg/mL	30 to 60 seconds
Scopolamine hydrobromide	Deionised water and ethanol:water 40:60 (v/v)	1.25 to 10.0 mg/mL	30 to 60 seconds
Cocaine and scopolamine	100 % ethanol, after 5 minutes drying	0.625 to 10.0 mg/mL	30 to 60 seconds
Ketamine hydrochloride	100 % ethanol	2.5 to 10.0 mg/mL	30 to 60 seconds

Laboratories record results at fixed intervals of 30 and 60 seconds. The colour change itself is immediate in practice; the times stated are protocol reading points, not minimum reaction times. In neat, undiluted ethanol (100 %) the full range from 0.625 mg/mL only develops after an extended development time of at least 16 hours. That matrix does not correspond to any ready-to-drink beverage; in ethanol:water 40:60 (v/v), which realistically represents high-alcohol spirits, detection occurs within the reading times stated above.

6 Summary of Analytical Performance

Substance	Sensitivity	Specificity	Accuracy	Source
Ketamine	97.67 %	100.00 %	98.84 %	CTLS, 2013; confirmed Lucideon, 2024
GHB	95.12 %	95.12 %	95.12 %	Strathclyde, 2014; confirmed Lucideon, 2024

Substance	Sensitivity	Specificity	Accuracy	Source
Cocaine	Detected 0.625 to 10.0 mg/mL	–	–	Lucideon, 2024
Scopolamine	Detected 1.25 to 10.0 mg/mL	–	–	Lucideon, 2024

Detection ranges were established for cocaine and scopolamine. A sensitivity and specificity calculation across a beverage series, as performed for ketamine and GHB, is not available for these two substances. Bormann Bioscience therefore states no percentage figures for them.

7 Known Limitations

- Highly acidic beverages, in particular bitter lemon and lime cordial, can produce a false negative result for GHB. This warning has been printed on the product packaging since 23 October 2024.
- Milk-based drinks and cream liqueurs as well as dark red beverages can produce a false positive result. Strongly coloured drinks also make the colour change harder to read.
- The test detects the presence of a substance, not its concentration. It is not a quantitative method.
- Very small doses, or doses below the ranges tested, may not be detected.
- The test covers only the four substances tested. A negative result is not an assurance that a beverage is safe and is no substitute for vigilance.
- The test is intended for consumer use and does not replace laboratory toxicology analysis.
- Single use only. Instructions must be followed exactly; the strip is not immersed in the beverage.

8 Regulatory Status

Product classification	Consumer safety product for beverage testing (chemical rapid test)
Medical device status	No. The test examines beverages only and no specimens derived from the human body. It therefore falls under neither MDR (EU) 2017/745 nor IVDR (EU) 2017/746. A conformity marking under those regulations is neither required nor claimed.
REACH	Compliant with Regulation (EC) No 1907/2006
Safety data sheet	Not required, article with no intended release of hazardous substances
Country of manufacture	United Kingdom
Intended users	Adult consumers as well as hospitality and security staff, lay use without training

9 Original Reports and Confidentiality

The complete original reports of the laboratories named above are held and archived by Bormann Bioscience LLC. They contain manufacturing, formulation and supply chain data and are subject to confidentiality agreements as well as reproduction restrictions imposed by the issuing laboratories. They can therefore not be released to third parties, either in full or in part.

For distribution partners and institutional purchasing departments, Bormann Bioscience LLC provides on request an extended version of this document containing the full result tables per beverage type and concentration level. A mutually signed non-disclosure agreement is a precondition. Please direct enquiries to info@getdrinkcheck.com. Supplementary product data is contained in Technical Data Sheet TDS-DC-001.