

GlutenTox® Sticks Plus

Quick test for the determination of gluten content

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1. Product Description

GlutenTox® Sticks Plus is a rapid and sensitive lateral flow immunoassay test for the semiquantitative determination, or even quantitative determination by means of GlutenTox® Reader, of gluten in all kind of foodstuffs, from raw materials to processed food and/or heat-processed foods and also products for personal care and cosmetics. It can also be used for surface detection to ensure the working surfaces are suited to produce gluten-free products.

The extraction solution provided in this kit, Universal Gluten Extraction Solution (UGES), is suited for all types of food thanks to the combination of denaturing agents, reducing agents and solubilizers. This extraction protocol achieves a more effective extraction of gliadins even in complex samples, such as heat-processed food and samples containing polyphenols, tannins or antioxidants.

The test is designed for quality control and research laboratories. It allows two options for the reading of the results:

- Visual reading. By using different dilutions, various cut-off can be assessed in less than one hour (ie. 3 ppm, 10 ppm, 20 ppm and/or 100 ppm).
- Digital reading with the Glutentox® Reader. A reliable and quantitative result is obtained in less than one and a half hour.

GlutenTox® Sticks Plus is based on an anti-gliadin-33mer mouse monoclonal antibody (G12) that is specific to the toxic fraction of gluten (33-mer peptide) and reacts to prolamins of wheat (gliadin), barley (hordein), rye (secalin), and oat (avenin).

2. Sensitivity/Specificity

- Detection limit of the assay 3 ppm of gluten in samples (detection limit of stick - 15 ng/mL of gliadin).
- Specific to prolamins of wheat (gliadin), barley (hordein), rye (secalin) and oat (avenin).
- Does not cross react with soy, rice or corn.

3. Reagents

- GlutenTox® Sticks (25 tests).
- Universal Gluten Extraction Solution (UGES) (250 mL).
- Dilution Solution (30 mL).
- Microtiter plate strips (4 strips x 8 wells).
- Positive Control (10 g).
- Negative Control (10 g).

4. Storage/Stability

To obtain optimal test performance, the product must be stored in its original packaging between 2°C and 30°C and used before expiration date.

5. Validation

To ensure the test's ability to analyze all types of food (of diverse nature) and other samples such as cosmetics and personal care products, different commercial samples have been tested. After analyzing the samples with GlutenTox® Sticks Plus in all types of matrices tested (see Tables 1 and 2) the results were satisfactory and consistent with the gluten found with the official method, which demonstrates the applicability of test on a broad range of samples.

Table 1. Food samples tested for validation of GlutenTox® Sticks Plus

Group	Tested samples
Flour and semolina	Corn flour, precooked corn flour, corn semolina, rice flour, wheat flour, buckwheat flour
Milk products	Cow milk, milk with soluble fiber, milk with cereals, natural or flavored yogurt, cheese spread, shredded cheese blend
Baked and cereal products	Toast, bread sticks, biscuits (Rich tea), chocolate cookies, Madeleines, cakes, cornflakes, pastas, corn pancakes, rice cakes, spelt cakes, snacks
Meat products	Minced turkey, minced chicken, turkey sausages, chicken nuggets, pork sausages, chorizo
Fishery products	Cod and Hake
Vegetables	Lettuce mix, scrambled eggs with vegetables
Broth, soups, creams and dry mixes	Vegetable broth, chicken rice soup, dehydrated vegetable soup, stock cubes, vegetable soup, peanut butter
Sauces, dressings, spices and condiments	Yogurt salad dressing, ketchup, soy sauce, salad dressing, garlic powder, paprika powder, cooking cream
Sugars	Glucose syrup, powdered sugar
Prepared meals and dishes	Meatballs in sauce with peas, egg ravioli with meat, beans stew
Beverages	Water, milk, fruit juices, beers, soy drinks, rice drinks, oat drinks, soft drinks

Table 2. Other samples tested for validation of GlutenTox® Sticks Plus

Group	Tested samples
Personal care products	Bath gel, shampoo, deodorant, toothpaste, mouthwash
Cosmetics	Creams (face, body and hands), cleanser, lip balm
Others	Pet food (dry food, wet food), cleaning products, medicines (tablets, capsules and syrups)

6. Applications

- For semi-quantification (or quantification by using a Reader) of gluten in food, beverages and other consumer products, including personal care and cosmetic products.
- For quality control of gluten free food.
- For research on gluten toxicity.
- To trace gluten contamination in food and working surfaces.
- For safety regulation according to HACCP, IFS and BRC programs.

7. References

Morón B, Cebolla A, Manyani H, Alvarez-Maqueda M, Megías M, Thomas M del C, López MC, Sousa C. Sensitive detection of cereal fractions that are toxic to celiac disease patients by using monoclonal antibodies to a main immunogenic wheat peptide. Am J Clin Nutr. (2008), 87:405-414.

Morón B, Bethune MT, Comino I, Manyani H, Ferragud M, López MC, Cebolla A, Khosla C, Sousa C., Toward the Assessment of Food Toxicity for Celiac Patients: Characterization of Monoclonal Antibodies to a Main Immunogenic Gluten Peptide, PLoS ONE (2008) 3: e2294.