

Product Instructions

Reveal Q+ MAX for Aflatoxin

The Toxin

Aflatoxin is a toxic and carcinogenic substance produced by certain strains of the molds *Aspergillus flavus* and *A. parasiticus*. There are four principal types of aflatoxin: B₁, B₂, G₁ and G₂. Aflatoxin B₁ is the most frequently encountered of the group and the most toxic. The commodities most affected by aflatoxin are corn, peanuts, cottonseed, milo, and the majority of tree nuts. The effects on animals ingesting excessive amounts of aflatoxin range from chronic health and performance problems to death. Aflatoxin has been shown to cause liver damage or cancer, decreased milk and egg production, immune suppression, and interference with reproductive efficiency. Many countries have set maximum allowable levels of aflatoxin in food and feed. Therefore, accurate determination of the toxin's presence is of major importance to those monitoring the quality of food and feed in which aflatoxin may occur. Testing these commodities for the toxin requires careful sampling, chemical extraction, quality assurance, and quantitative analysis.

Intended Use/User

Reveal[®] Q+ MAX for Aflatoxin is intended for the quantitative analysis of food commodities and feed for aflatoxin. The test kit is designed for use by quality control personnel and others familiar with commodities possibly contaminated by aflatoxin.

User Responsibility

- Users are responsible for familiarizing themselves with product instructions and information. Visit our website at neogen.com, or contact your local Neogen[®] representative or authorized distributor for more information.
- When selecting a test method, it is important to recognize that external factors such as sampling methods, testing protocols, sample preparation, handling, laboratory technique and the sample itself may influence results.
- It is the user's responsibility in selecting any test method or product to evaluate a sufficient number of samples with the appropriate matrices and challenges to satisfy the user that the chosen test method meets the user's criteria.
- It is also the user's responsibility to determine that any test methods and results meet its customers' and suppliers' requirements.
- As with any test method, results obtained from use of any Neogen Food Safety product do not constitute a guarantee of the quality of the matrices or processes tested.

Assay Principles

Reveal Q+ MAX for Aflatoxin is a single-step lateral flow immunochromatographic assay based on a competitive immunoassay format. The extract is wicked through a reagent zone, which contains antibodies specific to aflatoxin conjugated to colloidal gold particles. If aflatoxin is present, it will be captured by the particle-antibody complex. The aflatoxin-antibody-particle complex then is wicked onto a membrane, which contains a zone of aflatoxin conjugated to a protein carrier. This zone captures any uncomplexed aflatoxin antibody, allowing the particles to concentrate and form a visible line. As the level of aflatoxin in a sample increases, free aflatoxin will form a complex with the antibody-gold particles. This allows less antibody-gold to be captured in the test zone. Therefore, as the concentration of aflatoxin in the sample increases, the test line density decreases. Algorithms programmed into the readers convert these line densities into a quantitative result displayed in parts per million (ppm). The membrane also contains a control zone where an immune complex present in the reagent zone is captured by an antibody, forming a visible line. The control line always will form regardless of the presence of aflatoxin, ensuring the strip is functioning properly.

Storage Requirements

Store kit components at room temperature (18–30°C, 64–86°F) for full shelf life. Test strips should remain capped in their original tubes until used (for optimal performance).

Materials Provided

1. 25 Reveal Q+ MAX for Aflatoxin test strips
2. 25 red sample dilution cups
3. 25 clear sample cups
4. 25 MAX 1 Aqueous Extraction Packets
5. 1 bottle of sample diluent

Materials Recommended but Not Provided



1. Sample collection cups with lids (700004011 | 9428, 700004012 | 9428B)
2. Agri-Grind grinder or equivalent (100001350 | 9401, 700004021 | 9453)
3. Sasso Grinder (700007405)
4. Microcentrifuge tubes (700003932 | 9172)
5. Mini centrifuge (700003963 | 9330)
6. Filter syringes (700002724 | 9420)
7. Sample collection tubes with caps (700002726 | 9421, 700002727 | 9421B)
8. Whatman #4 filter paper or equivalent (700004035 | 9519, 700006493 | 9429)
9. Pipettor, 400 µL (700004074 | 9693, 700004075 | 9693MLA)
10. Pipettor, 250 µL (700004072, 9692)
11. Pipettor, 100 µL (100001422 | 9860, 100001330 | 9272)
12. Pipette tips, 1-200 µL (100001352 | 9407, 100001353 | 9410, 700004099 | 9417)
13. Pipette tips, 100 µL – 1 mL (100001373 | 9464, 100001378 | 9487, 700003938 | 9292)
14. Scale capable of weighing 5-50 g ±0.1 g (700004010 | 9427)
15. Timer (100001358 | 9426)
16. Reveal sample cup rack (700002734 | 9475)
17. Dispensing pump or graduated cylinder (700004020 | 9448, 100001367 | 9447)
18. Raptor® Integrated Analysis Platform (700002783 | 9680) or Raptor Solo Integrated Analysis Platform (700002790|9696)
19. Raptor Cartridges (700002786 | 9681)
20. Raptor 400 µL Exact Volume pipettes (700002787 | 9682)
21. Bulk MAX 1 Packets (700007762)

Precautions

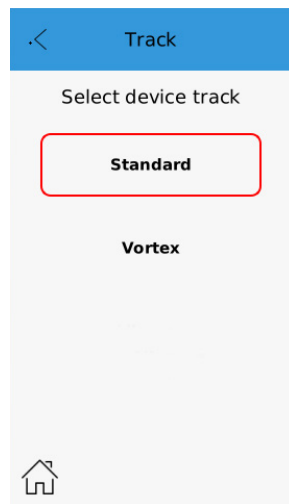
1. The test strips must remain inside the stay-dry tube before use.
2. Store test kit at room temperature (18–30°C, 64–86°F) when not in use. Do not freeze.
3. Do not use kit components beyond expiration date.
4. Treat all used liquids, including sample extract, and labware as if contaminated with aflatoxin. Gloves and other protective apparel should be worn at all times.
5. To avoid cross-contamination, use clean glassware for each sample, and thoroughly wash all glassware between samples.
6. Commodity extracts should have a pH of 6 – 8 before testing. Excessively acidic or alkaline samples should be adjusted. For instructions on adjusting pH, contact Neogen Technical Services.
7. Ensure the device lot number and the curve details match the lot ID number selected on the reader. Failure to update the lot-specific QR code within the Raptor® Solo reader will cause inaccurate results.

Raptor Solo Reader Set Up - Endpoint Procedure

The Solo reader must be in Standard mode to read the Reveal Q+ MAX for Aflatoxin test strips in Endpoint mode.

1. From the main menu, select the  in the upper left-hand corner
2. Select track replacement
3. Return to the home screen by pressing the  in the lower left-hand corner
4. Insert the track replacement tool with the arrow facing towards you into the track in the unit
5. Gently pull up to remove the track
6. Insert the standard Endpoint testing track into the unit (track with the blue dot on the right-hand side)

Note: Each track is color coded with dots. The endpoint track is identified with a blue dot, and the vortex track a yellow dot.



Testing track removal tool





Testing Track — EndPoint

Raptor Solo Reader Set Up - Vortex Procedure

The Solo reader must be in Vortex mode to read the Reveal Q+ MAX for Aflatoxin test strips **not** in Endpoint mode.

Note: This is the default mode for the reader and will only need to be changed if switched to Standard (endpoint) mode.

1. From the main menu, select the  in the upper left-hand corner
2. Select track replacement
3. Return to the home screen by pressing the  in the lower left-hand corner
4. Insert the track replacement tool with the arrow facing towards you into the track in the unit
5. Gently pull up to remove the track
6. Insert the Vortex testing track into the unit. The vortex track is identified with a yellow dot, and the endpoint track a blue dot.

Reagent Preparation

1. For prep of Bulk MAX packet only: Add (1) Bulk MAX packet to 1 Liter of distilled or deionized water. Swirl/shake to dissolve into solution.

Sample Preparation

The sample to be tested should be collected according to accepted sampling techniques (see FGIS sampling protocol or contact your Neogen representative). Obtain a representative sample (minimum 100 g). Grind the sample so at least 95% of the ground material passes through a 20-mesh sieve (about the particle size of fine espresso).

Sample Extraction

1. Weigh out 10 g \pm 0.1 of sample into an extraction cup.
2. Add the contents of (1) MAX 1 packet to the sample, and then 50 mL of distilled or deionized water. Alternatively, add 50 mL of prepared bulk MAX 1 solution to the sample.
3. Vigorously shake, using hand or mechanical means, for 3 minutes, or blend for 1 minute.
4. Allow the sample to settle, then filter with a filter syringe or Whatman #4 filter paper to collect a minimum of 3 mL filtrate into a sample collection tube. Or you may also pipette 1 mL of sample into a 2.0 mL microcentrifuge tube, and centrifuge for 30 seconds using a microcentrifuge (approx. 2,000 x g).
5. The sample is now ready for testing.

Test Procedure

Raptor Solo Endpoint

1. Select the assay type (e.g., aflatoxin) from the menu and ensure the device lot number matches the lot ID number selected on the reader.
2. Place the appropriate number of red sample dilution cups and clear sample cups into a sample cup rack. Label cups if necessary.
3. Add 100 μ L of sample extract to a red dilution cup.
4. Add 100 μ L of sample diluent to the red dilution cup with the sample. Mix by pipetting up and down 5 times.
5. Transfer 100 μ L of diluted sample extract into a clear sample cup.
6. Place a new Reveal Q+ MAX for Aflatoxin test strip with the sample end down into the sample cup and set timer for **6 minutes**. Ensure the test strip comes into contact with liquid and begins to wick.
7. Remove the strip from the sample cup after it has developed for **6 minutes** and read immediately (within 30 seconds).
8. Fully insert the Reveal Q+ MAX test strip into the cartridge with the sample end first and results facing out.
9. Results are displayed and stored on the unit. Samples greater than 50 ppb must be diluted and re-tested.

Dilution Procedure

Samples greater than 50 ppb must be diluted and re-tested.

1. Add 100 μL of sample filtrate to a sample collection tube. Add 500 μL of distilled or deionized water. Mix well by pipetting up and down 5 times.
2. Place the appropriate number of red sample dilution cups and clear sample cups into a sample cup rack. Label cups if necessary.
3. Add 100 μL of diluted sample filtrate (from step one) to a new red sample dilution cup.
4. Add 100 μL of sample diluent to the red dilution cup with the sample. Mix by pipetting up and down 5 times.
5. Transfer 100 μL of diluted sample extract (from step 4) into a clear sample cup.
6. Place a new Reveal Q+ MAX for Aflatoxin test strip with the sample end down into the sample cup and set timer for 6 minutes. Ensure the test strip comes into contact with liquid and begins to wick.
7. Remove the strip from the sample cup after it has developed for 6 minutes and read immediately (within 30 seconds).

Note: The reader will not calculate your dilution. Final result displayed will need to be multiplied by 6.

Test Procedure

Raptor Integrated Analysis Platform (or Raptor Solo in Vortex Mode)

1. Place the appropriate number of red sample dilution cups into a sample cup rack. Label cups if necessary.
2. Add 250 μL of sample filtrate to each red sample dilution cup.
3. Add 250 μL of sample diluent to each red sample dilution cup. Mix by pipetting up and down five times.
4. Fully insert a Reveal Q+ MAX for Aflatoxin test strip into a Raptor cartridge.
5. Insert the Raptor cartridge containing the test strip into any of the three ports within the Raptor Integrated Analysis Platform reader or single port within the Raptor Solo.
 - a. The bar code on the test strip will be read – the Raptor reader identifies the type of test strip and the lot number. If the lot number is not found in the system, the bar code reader on the front of the Raptor will turn on automatically.
 - b. Scan the QR code found on the tube containing the test strips. The information will be stored on the system.
6. Enter a sample ID if desired. Hit the Accept button to go to the Add Sample screen.
7. Add 400 μL of sample from the red sample dilution cup (from step 3) to the Raptor cartridge.
 - a. The Raptor reader will start automatically.
 - b. Additional samples can be started in the other ports while the first sample is processing
8. Results will be displayed on the Raptor screen after the 6-minute testing is complete.

Dilution Procedure

Raptor Integrated Analysis Platform

Samples greater than 50 ppb must be diluted and re-tested.

1. Place the appropriate number of red sample dilution cups into a sample cup rack. Label cups if necessary.
2. Add 100 μL of sample filtrate to a sample collection tube.
3. Add 500 μL of distilled or deionized. Mix well by pipetting up and down 5 times.
4. Transfer 250 μL of diluted sample (from step 3) to a new red sample dilution cup.
5. Add 250 μL of sample diluent to the red sample dilution cup. Mix by pipetting up and down five times.
6. Fully insert a Reveal Q+ MAX for Aflatoxin test strip into a Raptor cartridge.

7. Insert the Raptor cartridge containing the test strip into any of the three ports within the Raptor Integrated Analysis Platform reader or single port within the Raptor Solo.
 - a. The bar code on the test strip will be read – the Raptor reader identifies the type of test strip and the lot number. If the lot number is not found in the system, the bar code reader on the front of the Raptor will turn on automatically.
 - b. Scan the QR code found on the tube containing the test strips. The information will be stored on the system.
8. Enter a sample ID if desired. Hit the Accept button to go to the Add Sample screen.
9. Add 400 µL of sample extract from the red sample dilution cup (from step 5) to the Raptor cartridge.
10. The Raptor reader will start automatically
11. Additional samples can be started in the other ports while the first sample is processing
12. Results will be displayed on the Raptor screen after the 6-minute testing is complete. The final result will need to be multiplied by 6.

Performance Characteristics

Reveal Q+ MAX for Aflatoxin is designed for the quantitative analysis of aflatoxin.

1. Range of detection: 3-300 ppb (with dilution)

Note: Samples greater than 50 ppb must be diluted and re-tested. Positive results below the range of detection should be reported as less than 3 ppb.

Customer Service

Neogen Customer and Technical Services can be contacted through [neogen.com](https://www.neogen.com) and product training is available by request.

SDS Information Available

Safety data sheets (SDS) are available for this test kit, and all of Neogen's test kits, on Neogen's Web site at [neogen.com](https://www.neogen.com), or by calling Neogen at 800.234.5333 or 517.372.9200.

Terms and conditions

Neogen's full terms and conditions are available [online](#).

Warranty

Neogen Corporation makes no warranty of any kind, either expressed or implied, except that the materials from which its products are made are of standard quality. If any materials are defective, Neogen will provide a replacement of the product. Buyer assumes all risk and liability resulting from the use of this product. There is no warranty of merchantability of this product, or of the fitness of the product for any purpose. Neogen shall not be liable for any damages, including special or consequential damage, or expense arising directly or indirectly from the use of this product.

