

**U.S. English**

*Product Number:*  
8375

***Reveal<sup>®</sup> Q+***

*for DON Endpoint*

*for use with Raptor<sup>®</sup> Solo Reader*

FGIS 2021-154



# Reveal<sup>®</sup> Q+ for DON Endpoint

Product Number: 8375

## The Toxin

Deoxynivalenol (DON) most commonly is produced by the pink mold *Fusarium graminearum*. DON, a member of the trichothecene family, is produced by fungi living on cereal commodities such as wheat, corn, barley, and ensilages. The toxicological effects attributed to DON include nausea (vomiting), feed refusal, gastroenteritis, diarrhea, immunosuppression, and blood disorders.

Pigs have been shown to be highly sensitive to DON. They will refuse to eat feeds when DON levels of  $\geq 1$  parts per million (ppm) are present. DON and its analogs cause toxic effects in other species as well, with varying degrees of sensitivity. DON has been implicated in causing problems in processed food, including off-flavor in ready-to-eat cereals and adverse effects on dough quality. Accurate determination of the presence of the toxin is of major importance to those monitoring the quality of feed and food in which DON may occur. Testing these commodities for the toxin requires careful sampling, extraction, sanitation, and quantitative analysis.

### The FDA has issued advisory levels for DON as follows:

For	Level	Commodities
Humans	1 ppm	Finished wheat products (flour, bran, and germ)
Ruminating beef, feedlot cattle, and chickens	10 ppm in < 50% of diet (5 ppm total diet)	All grains, grain by-products
Swine	5 ppm in < 20% of diet (1 ppm total diet)	All grains, grain by-products
All other animals	5 ppm in < 40% of diet (2 ppm total diet)	All grains, grain by-products

### European Union regulations for DON as follows:

Foodstuffs	Maximum levels parts per billion (ppb)
Unprocessed cereals other than durum wheat, oats, and maize	1250 ppb
Unprocessed durum wheat and oats	1750 ppb
Cereal flour, including maize flour, maize grits, and maize meal	750 ppb
Bread, pastries, biscuits, cereal snacks, and breakfast cereals	500 ppb
Processed cereal-based foods for infants and young children and baby food	200 ppb

neogen.com

## Intended Use or User

Reveal® Q+ for DON Endpoint is intended for the quantitative analysis of DON levels in grain and grain products, such as wheat, barley, corn, oats, and soybeans. The test kit is designed for use by quality control personnel and others familiar with commodities possibly contaminated by DON. Reveal Q+ for DON Endpoint is for use with the Raptor® Solo reader only.

## Assay Principles

Reveal Q+ for DON Endpoint is a single-step lateral flow immunoassay. The extract is wicked through a reagent zone, which contains antibodies specific for DON conjugated to colloidal gold particles. If DON is present, it will be captured by the particle-antibody complex. The DON-antibody-particle complex then is wicked onto a membrane, which contains a zone of DON conjugated to a protein carrier. This zone captures any uncomplexed DON antibody, allowing the particles to concentrate and form a visible line. As the level of DON in a sample increases, free DON will complex with the antibody-gold particles. This, in turn, allows less antibody-gold to be captured in the test zone. Therefore, as the concentration of DON in the sample increases, the test line density decreases. Algorithms programmed into the reader convert these line densities into a quantitative result displayed in 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 will always form regardless of the presence of DON, ensuring the strip is functioning properly.

## Storage Requirements

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

## Materials Provided

1. 25 Reveal Q+ for DON test strips
2. 25 red sample dilution cups
3. 25 clear sample cups
4. 2 bottles of sample diluent

## Materials Recommended But Not Provided



1. Extraction materials
  - a. Sample collection cups with lids 125 mL (Neogen® item 9428, 9428B)
  - b. Sample collection tubes with caps (Neogen item 9421, 9421B)
  - c. Filter syringes, Whatman No. 4 filter paper or equivalent (Neogen item 9420, 9429, 9519)
  - d. Centrifuge, mini (Neogen item 9330)
  - e. Microcentrifuge tubes (Neogen item 9172)
  - f. Dispensing pump or graduated cylinder (Neogen item 9448, 9447)
  - g. Distilled or deionized water
2. Agri-Grind grinder or equivalent (Neogen item 9401, 9453)
3. Scale capable of weighing 5–50 g  $\pm$  0.1 g (Neogen item 9427)
4. Timer (Neogen item 9426)
5. Reveal sample cup rack (Neogen item 9475)
6. Pipettor, 100  $\mu$ L (Neogen item 9860)
7. Pipette tips, 1–200  $\mu$ L (Neogen items 9407, 9410, 9417)
8. Pipettor, 100–1,000  $\mu$ L (Neogen items 9463)
9. Pipette tips, 100–1,000  $\mu$ L (Neogen items 9464, 9487)
10. Raptor® Solo Integrated Analysis System (Neogen item 9696)

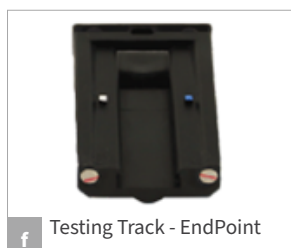
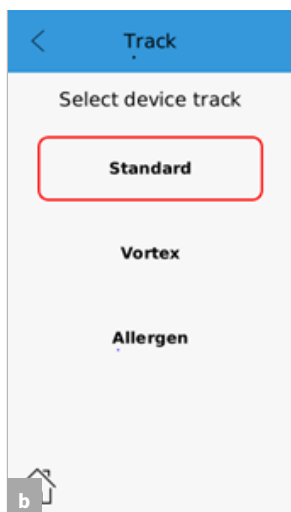
## Precautions

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 listed on kit box label.
4. Treat all used liquids, including sample extract, and labware as if contaminated with DON.
5. 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 a Neogen representative or technical services.

## Solo Reader Setup

**Note:** The Reveal Q+ for DON EndPoint can only be read using the Raptor Solo reader. Test strips should be read within 30 seconds of the completion of the 3 minute incubation.

1. The Solo reader must be in Standard mode to read the Reveal Q+ for DON Endpoint test strips.
  - a. From the main menu, select the  in the upper left-hand corner
  - b. Select track replacement — select standard
  - c. Return to the home screen by pressing the  in the lower left-hand corner
  - d. Insert the track replacement tool with the arrow facing towards you into the track in the unit
  - e. Gently pull up to remove the track
  - f. Insert the standard Endpoint testing track into the unit (track with the blue dot on the right-hand side)



## Sample Preparation — 10 g Sample

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 — 10 g Sample

1. Extract at a ratio of 1 part sample to 10 parts distilled or deionized water. For example, combine 10 g of ground sample with 100 mL of distilled or deionized water.
2. Vigorously shake, using hand or mechanical means (250 rpm) for 3 minutes, or blend for 1 minute.
3. Allow the sample to settle, then filter at least 4 mL with a filter syringe, or Whatman No. 1 filter paper.
4. You may also pipette 1.5 mL of sample into a 2.0 mL microcentrifuge tube, and centrifuge for 30 seconds.
5. The sample is now ready for testing.

## Test Procedure — 10 g Sample

1. Place the appropriate number of red sample dilution cups and clear sample cups into a sample cup rack. Label cups if necessary.
2. Add 100 µL of sample extract to each red sample dilution cup.
3. Add 1,000 µL of sample diluent to red sample dilution cup. Mix by pipetting up and down 5 times.
4. Transfer 100 µL of diluted sample extract into a new clear sample cup.

- Place a new Reveal Q+ for DON test strip with the sample end down into the sample cup and set timer for 3 minutes. Ensure the test strip comes into contact with liquid and begins to wick.
- Remove the strip from the sample cup after it has developed for exactly 3 minutes. Immediately (within 30 seconds) read the test strip in the Raptor Solo reader using the Endpoint cartridge adaptor.

## Reading a Test Strip

- From the home screen:  
Select category: Mycotoxin Q+.  
Select test: Q+ DON Endpoint.
- Press run test. Select lot (if not listed, add the lot by scanning the QR code located on the device tube).
- Enter sample ID as needed — press accept.
- Fully insert the Reveal Q+ DON Endpoint test strip into the Neogen labeled cartridge adaptor with the sample end first.
- Insert cartridge into the track on the Solo reader — system will read automatically.
- Results are displayed on the unit. Samples greater than 6 ppm must be diluted and retested.
- To read the next test strip, press change at the bottom of the screen — this allows the user to enter the next sample ID. Press accept and insert cartridge containing the next test strip.

**Note:** The Reveal Q+ for DON Endpoint can only be read using the Raptor Solo reader. Test strips should be read within 30 seconds of the completion of the 3-minute incubation.

## Dilution Procedure

Samples greater than 6 ppm will need to be diluted and retested.

- Add 100 µL sample filtrate to a sample collection tube (use sample filtrate obtained in Sample Extraction Procedure from page 4, step 3 or 4).
- Add 500 µL distilled or deionized water to the sample collection tube. Mix well by pipetting up and down 5 times, or cap the tube and shake.
- Add 100 µL of diluted sample extract (from step 2) to each red sample dilution cup.
- Add 1,000 µL of sample diluent (blue labeled bottle) to the red dilution cup with sample extract. Mix by pipetting up and down 5 times.
- Transfer 100 µL of diluted sample extract into a new clear sample cup.
- Place a new Reveal Q+ for DON test strip with the sample end down into the sample cup and set timer for 3 minutes. Ensure the test strip comes into contact with liquid and begins to wick.
- Remove the strip from the sample cup after it has developed for exactly 3 minutes. Immediately (within 30 seconds) read the test strip in the Raptor Solo reader.
- The final result displayed will need to be multiplied by 6.

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

## FGIS Extraction Procedure — 50 g Sample

- Weigh 50 ± 0.2 g of ground sample into a Whirl-Pak bag.
- Add 250 mL distilled or deionized water and close bag securely.
- Shake vigorously on a mechanical shaker at 250 rpm (or by hand with similar shaking action for 3 minutes).
- Allow the sample to settle
- Filter sample extract using a filter syringe to obtain 3-5 mL filtrate. (Note: filtrate should be clear of any particulates – if cloudy, re-filter.)
- Dilute the filtrate 3 +2 with distilled or deionized water.
  - Example: add 900 µL filtrate (from step 5) to sample collection tube. Add 600 µL of distilled water. Mix well.
- Proceed to FGIS Test Procedure

## FGIS Test Procedure — 50 g Sample

1. Place the appropriate number of red sample dilution cups and clear sample cups into a sample cup rack. Label cups if necessary.
2. Add 100 µL of diluted filtered extract (from step 6 of FGIS Extraction Procedure) to each red sample dilution cup.
3. Add 1,000 µL of sample diluent to red sample dilution cup. Mix by pipetting up and down 5 times.
4. Transfer 100 µL into a clear sample cup.
5. Place a Reveal Q+ for DON test strip with the sample end down into the sample cup and set timer for 4 minutes. Ensure the test strip comes into contact with liquid and begins to wick.
6. Remove the strip from the sample cup after it has developed for exactly 4 minutes. Immediately (within 30 seconds) read the test strip in the Raptor Solo reader using the Endpoint cartridge adaptor.

## FGIS Reading a Test Strip — 50 g Sample

1. From the Raptor Solo home screen:
  - a. Select category: Mycotoxin Q+.
  - b. Select test: Q+DON Endpoint FGIS.
2. Press run test. Select lot (if not listed, add the lot by scanning the QR code located on the enclosed QR code card).
3. Enter sample ID as needed – press accept.
4. Fully insert the Reveal Q+ DON Endpoint test strip into the Neogen labeled cartridge adaptor with the sample end first.
5. Insert cartridge into the track on the Solo reader — system will read automatically.
6. Results are displayed on the unit. Samples greater than 6 ppm must be diluted and retested.
7. To read the next test strip, press change at the bottom of the screen — this allows the user to enter the next sample ID. Press accept and insert cartridge containing the next test strip.

**Note:** The reveal Q+ for DON Endpoint can only be read using the Raptor Solo reader. Test strips should be read within 30 seconds of the completion of the 4-minute incubation.

## Performance Characteristics

Range of quantitation: 0.3–6 ppm

**Note:** Samples greater than 6 ppm must be diluted and retested. Samples less than the range of quantitation should be reported as less than 0.3 ppm.

## Validated and Verified Matrices

Neogen continues to validate new commodities. Please contact a representative for the latest validated commodity list.

## Customer Service

Neogen customer and technical services can be contacted through [neogen.com](https://neogen.com) and product training is available by request.

## Safety Data Sheets (SDS) Information Available

SDS are available for all test kits at [neogen.com](https://neogen.com) or by calling 800.234.5333 or 517.372.9200.

## Terms and Conditions

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

## Warranty

Neogen 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.

**neogen.com**