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Welchrom® Immunoaffinity Column

Overview

Mycotoxins are toxic metabolites produced by molds, known for their strong carcinogenic effects and immune-suppressing properties. Common mycotoxins include aflatoxins, ochratoxins, vomitoxin, trichothecene (T-2 toxin), zearalenone, moniliformin, fumonisins, etc. Grains and feed are susceptible to contamination by mycotoxins, posing a significant challenge in modern agricultural production. Leveraging its robust research capabilities and advanced manufacturing processes, Welch Materials has developed a series of immunoaffinity columns specifically designed for mycotoxin detection. These products have undergone rigorous scientific testing, received certifications from various official testing agencies, and are widely applicable in testing laboratories, import-export organizations, and other related fields.

Welchom® Immunoaffinity Columns are utilized for the separation and purification of mycotoxins from samples, based on the principle of a specific reaction between antigens and antibodies. The antibodies within the immunoaffinity column are suspended in the gel through covalent bonds, allowing for the specific adsorption of mycotoxins from the sample. If the sample being tested contains mycotoxins, as it passes through the immunoaffinity column, the toxins are captured and bound by the antibodies. All other substances are washed out from the immunoaffinity column. Methanol, serving as the elution solution, is used to wash the mycotoxins off the antibodies.

Features

1. The highly specific and high-affinity monoclonal antibodies ensures the acquisition of high-purity samples.
2. Large column capacity and high antibody content increase sample adsorption, enhancing purification efficiency.
3. Allows purification of large-volume samples, providing excellent concentration effects for low-concentration samples, effectively improving detection methods.
4. Products undergo extensive scientific experiments, demonstrating good stability and reliability, with sample recovery rates reaching 90%-110%.
5. Strong versatility, suitable for various buffer systems, eliminating the need for complex and toxic reagents.
6. Simple and fast operation, with only 10-15 minutes required for a single sample. High applicability without the need for a specific experimental environment.
7. Purified samples are suitable for ELISA, HPLC, fluorescence spectrophotometry, and other methods.

1. Operating Instructions

Fumonisin Immunoaffinity Column Operating Instructions

Overview:

Fumonisins are secondary metabolites produced by fungi of the genus Fusarium. Common variants include Fumonisin B_1, B_2, B_3, etc., and they are widely present in various grains, with corn being a representative source.

It has been proven that fumonisins can induce diseases such as leukoencephalomalacia in horses, porcine pulmonary edema, and can also contribute to the development of esophageal cancer, liver cancer, and gastric cancer in humans. Therefore, it is crucial to prevent foods and feeds contaminated with fumonisins from directly or indirectly entering the human food chain. Strengthening the detection of fumonisins is of utmost importance.

Performance:

Designed for sample pre-treatment in the qualitative and quantitative detection of fumonisins in samples such as grains, alcoholic beverages, and feeds.

Column capacity: ≥5000ng

Recovery rate: ≥80%

Principle:

The basis of this product's determination is the specific reaction between antigens and antibodies. to Fumonisin Monoclonal antibodies are immobilized on the gel inside the column. Fumonisin in the sample is extracted, filtered, and diluted. The sample extract is then slowly passed through the Fumonisin immunoaffinity column. Inside the immunoaffinity column, Fumonisin binds to the antibodies. Subsequently, the immunoaffinity column is washed to remove unbound substances. Fumonisin is eluted with methanol and then injected into analytical instruments for detection.

Required Equipment and Reagents:

Equipment:

----High-speed homogenizer or tissue homogenizer ----Grinder

----200mL/50mL graduated cylinders ----Balance: Resolution 0.1g

----Micropipette: Single-channel 100uL~1000uL ----Folded filter paper (qualitative or quantitative filter paper)

----Glass microfiber filter (1.5mm pore size) ----Disposable glass test tube

----50mL funnel ----Pump flow operation stand (including air pump, glass syringes with different volumes, etc.)

Reagents:
----Methanol (chromatography grade) ----Distilled water or deionized water
----Phosphate Buffered Saline Solution (PBS Buffer, pH 7.0): Weigh 8.0g sodium chloride, 1.2g disodium hydrogen phosphate, 0.2g potassium dihydrogen phosphate, 0.29g potassium chloride. Dissolve in 990mL distilled water, adjust pH to 7.0 with concentrated hydrochloric acid, and finally dilute to 1000mL with distilled water.
----Cleaning Buffer: 25g sodium chloride+5g sodium hydrogen carbonate + 0.1mL Tween-20. Dilute with distilled water to 1000mL.

Reagent Preparation:
Prepare a solution of methanol-water (8:2) as the sample extraction solution.

Sample Processing Steps:
(I) Peanuts, corn, rice, wheat, and their products and feed (1mL test solution is equivalent to 0.4g of the sample):
----Weigh 20g of finely ground sample into a 100mL volumetric flask, add 5.0g of sodium chloride, and make up to volume with methanol-water (8:2) solution;
----Transfer to a homogenization cup, homogenize at high speed for 2 minutes;
----Centrifuge at 4000r/min for 5 minutes or filter through quantitative filter paper;
----Take 10mL of the filtrate and add 40mL of PBS buffer for dilution. Filter through glass microfiber filter, and the filtered liquid is ready for testing;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 10.0mL of the sample extract into the glass syringe;
----Connect the air pressure pump to the glass syringe, adjust the pressure to allow the solution to flow slowly through the immunoaffinity column at a rate of about 1 drop per second until 2-3mL of air has passed through the column;
----Rinse the column once with 10.0mL of cleaning buffer at a flow rate of 1-2 drops/s, discard all the effluent;
----Rinse the column again with 10.0mL of PBS at a flow rate of 1-2 drops/s, discard all the effluent, and allow 2mL~3mL of air to pass through the column;
----Accurately add 1.0mL of chromatography-grade methanol for elution, at a flow rate less than 1 drop/s. Collect all the eluate in a glass test tube for testing.

(II) Beer, rice wine, and other alcoholic beverages (1mL of detection solution is equivalent to 5mL of sample)
----Take 10mL of the test sample, degas it, and filter it through glass microfiber filter. Collect the filtered liquid for testing;

----Connect the immunoaffinity column to a 10.0mL glass syringe. Transfer 5.0mL of the filtered sample into the glass syringe;
----Connect the air pressure pump to the glass syringe, adjust the pressure to allow the solution to pass through the immunoaffinity column at a slow rate of approximately 1 drop/s until 2~3mL of air passes through the column;
----Rinse the column once with 2mL of PBS solution at a flow rate of 1 drop-2 drops/s, discard all effluent,
----Rinse the column once more with 2mL of water at a flow rate of 1 drop-2 drops/s, discard all effluent, and allow 2mL~3mL of air to pass through the column;
----Accurately add 1.0mL of chromatographic grade methanol for elution, with a flow rate less than 1 drop/s, collect all eluates in glass test tubes for testing.

Result Interpretation:

After purification by the immunoaffinity column, the collected methanol eluate can be directly used for detection with a fluorescence spectrophotometer or HPLC, or it can be tested using thin-layer chromatography or enzyme-linked immunosorbent assay (ELISA) kits. Due to the low response value of fumonisins, when detected by HPLC, it generally needs to be dried with nitrogen and then derivatized for detection (refer to GB/T25228-2010).

Precautions:

----Fumonisin toxin poses extreme hazards. Gloves should be worn during handling.
----Do not use immunoaffinity columns that have exceeded their expiration date.

Storage and Preservation:

Storage Conditions: Store at 2-8°C, do not freeze.
Shelf Life: The product is valid for 18 months.

Aflatoxin B_1 Immunoaffinity Column Operating Instructions

Overview:

Aflatoxin is a secondary metabolite produced by fungi such as Aspergillus flavus and Aspergillus parasiticus. Classified by the International Agency for Research on Cancer (IARC) as a Group I carcinogen, aflatoxin is also an extremely toxic substance widely found in various foods. Main sources of aflatoxin include corn, peanuts, rice, wheat, and their by-products. Aflatoxin B_1 in feed, after animal metabolism, produces aflatoxin M_1, which remains highly toxic and carcinogenic. Aflatoxin is a major factor contributing to liver cancer, as well as gastric and intestinal cancers, posing significant threats to human health. Strict regulations on aflatoxin levels in food and feed are enforced by countries worldwide.

Performance:
Designed for sample pre-treatment in the qualitative and quantitative detection of Aflatoxin B_1 in food and feed samples such as grains, non-staple foods and alcoholic beverages, etc.
Column capacity: ≥300ng
Recovery rate: ≥90%

Principle:
The basis of this product's determination is the specific reaction between antigens and antibodies. Aflatoxin B_1 monoclonal antibodies are immobilized on the gel inside the column. Aflatoxin B_1 in the sample is extracted, filtered, and diluted. The sample extract is then slowly passed through the Aflatoxin B_1 immunoaffinity column. Inside the immunoaffinity column, Aflatoxin B_1 binds to the antibodies. Subsequently, the immunoaffinity column is washed to remove unbound substances. Aflatoxin B_1 is eluted with methanol and injected into the analytical instrument for detection.

Required Equipment and Reagents:
Equipment:
----High-speed homogenizer or tissue homogenizer ----Grinder
----200mL/50mL graduated cylinders ----Balance: Resolution 0.1g
----Micropipette: Single-channel 100uL~1000uL ----Folded filter paper (qualitative or quantitative filter paper)
----Glass microfiber filter (1.5mm pore size) ----Disposable glass test tube
----50mL funnel - ---Pump flow operation stand (including air pump, glass syringes with different volumes, etc.)
Reagents:
----Methanol (chromatography grade) ----Distilled water or deionized water
----Phosphate Buffered Saline Solution (PBS Buffer, pH 7.0): Weigh 8.0g sodium chloride, 1.2g disodium hydrogen phosphate, 0.2g potassium dihydrogen phosphate, 0.29g potassium chloride. Dissolve in 990mL distilled water, adjust pH to 7.0 with concentrated hydrochloric acid, and finally dilute to 1000mL with distilled water.
----Tween-20/PBS solution (0.1%): Take 1mL Tween-20, add it to the PBS buffer solution, and make up to 1000mL.

Reagent Preparation:
Prepare methanol-water solutions of varying concentrations according to the specific sample requirements to be used as the sample extraction solution.

Sample Processing Steps:
(I) For peanuts, corn, rice, wheat and their products, vegetable oils, and feed

----Take 25g of ground sample (for vegetable oils, take directly without processing) and mix with 125mL methanol-water (7:3) solution;
----Add 5.0g of sodium chloride and homogenize at high speed for 2 minutes;
----Centrifuge at 4000r/min for 5 minutes or filter through folded qualitative or quantitative filter paper;
----Take 15mL of the filtrate and add 30mL of water for dilution. Filter the diluted liquid through glass microfiber filter paper. The filtered liquid is ready for testing;
----Connect the immunoaffinity column to a 20.0mL glass syringe. Accurately transfer 15.0mL of the sample extractionsolution into the glass syringe;
----Connect the air pressure pump to the glass syringe, adjust the pressure to allow the solution to flow slowly through the immunoaffinity column at a rate of about 6mL/min until 2~3mL of air passes through the column;
----Rinse the column twice with 10.0mL of water, discard all the eluate, and pass 2mL~3mL of air through the column;
----Accurately add 1.0mL of chromatographic grade methanol for elution, with a flow rate of 1mL/min~2mL/min, collect all the eluate in glass tubes for detection.

(II) Soy Sauce
----Mix 50g of the sample with 100mL of methanol-water (8:2) solution;
----Add 2.59g of sodium chloride and homogenize at high speed for 1 minute;
----Centrifuge at 4000rpm for 5 minutes or filter using folded qualitative or quantitative filter paper;
----Take 10mL of the filtrate and add 40mL of water for dilution, filter using glass microfiber filter paper;
----The diluted liquid is ready for testing;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 10.0mL of the sample extract into the glass syringe;
----Connect the air pressure pump to the glass syringe and adjust the pressure to allow the solution to flow slowly through the immunoaffinity column at a rate of about 6mL/min until 2~3mL of air passes through the column;
----Wash the column with 10.0mL of 0.1% Tween/PBS, followed by rinsing the column twice with 10.0mL of water, discard all the eluate, and pass 2mL~3mL of air through the column;
----Accurately add 1.0mL of chromatographic grade methanol for elution, with a flow rate of 1mL/min~2mL/min, collect all the eluate in glass tubes for detection.

(III) Vinegar
----Take 5g of the sample and add 1.0g of sodium chloride;
----Dilute with pH 7.0 phosphate buffer solution to a final volume of 25.0mL;

----Centrifuge at 4000rpm for 5 minutes or filter using folded qualitative or quantitative filter paper;
----Take 10mL of the filtrate and add 10mL of water for dilution, filter using glass microfiber filter paper;
----The diluted liquid is ready for testing;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 10.0mL of the sample extract into the glass syringe;
----Connect the air pressure pump to the glass syringe and adjust the pressure to allow the solution to flow slowly through the immunoaffinity column at a rate of about 6mL/min until 2~3mL of air passes through the column;
----Wash the column with 10.0mL of 0.1% Tween/PBS, followed by rinsing the column twice with 10.0mL of water, discard all the eluate, and pass 2mL~3mL of air through the column;
----Accurately add 1.0mL of chromatographic grade methanol for elution, with a flow rate of 1mL/min~2mL/min, collect all the eluate in glass tubes for detection.

Results Interpretation:
After purification with the immunoaffinity column, the collected methanol eluate can be directly used for detection with a fluorescence spectrophotometer or HPLC, or it can be tested using thin-layer chromatography or enzyme-linked immunosorbent assay (ELISA) kits. The content of aflatoxin B_1 in 1mL eluate collected is equivalent to the content of aflatoxin B_1 in 1g of the sample.

Precautions:
----Aflatoxin poses extreme hazards. Gloves should be worn during handling;
----It is recommended to soak glass containers that have been used with aflatoxin solutions in a 5% concentration sodium hypochlorite solution overnight;
----Do not use immunoaffinity columns that have exceeded their expiration date.

Storage and Preservation:
Storage conditions: Store at 2-8°C, do not freeze.
Shelf life: The product is valid for 18 months.

Aflatoxin M_1 Immunoaffinity Column Operating Instructions

Overview:

Aflatoxin is a secondary metabolite produced by fungi such as Aspergillus flavus and Aspergillus parasiticus. Classified by the International Agency for Research on Cancer (IARC) as a Group I carcinogen, aflatoxin is also an extremely toxic substance widely found in various foods. Main sources of aflatoxin include corn, peanuts, rice, wheat, and their by-products. Aflatoxin B_1 in feed, after animal metabolism, produces aflatoxin M_1, which remains highly toxic and carcinogenic. Aflatoxin is a major factor contributing to liver cancer, as well as gastric and intestinal cancers, posing significant threats to human health. Strict regulations on aflatoxin levels in food and feed are enforced by countries worldwide. The National Standards for Dairy Product Safety implemented on June 1, 2010, regulate the detection of toxins in milk and dairy products, primarily utilizing the immunoaffinity column purification method.

Performance:

Designed for sample pre-treatment in the qualitative and quantitative detection of aflatoxin M_1 in samples such as milk, milk powder, fermented milk, cheese, and cream.
Column capacity: ≥200ng
Recovery rate: ≥90%

Principle:

The basis of this product's determination is the specific reaction between antigens and antibodies. Monoclonal antibodies to Aflatoxin M_1 are immobilized on the gel inside the column. Aflatoxin M_1 in the sample is extracted, filtered, and diluted. The sample extract is then slowly passed through the aflatoxin M_1 immunoaffinity column. Inside the immunoaffinity column, the aflatoxin M_1 binds to the antibody. Subsequently, the immunoaffinity column is washed to remove unbound substances. Aflatoxin M_1 is eluted with methanol and then injected into the analytical instrument for detection.

Equipment and Reagents:

Equipment:

----High-speed homogenizer or tissue homogenizer
----200mL/50mL graduated cylinders
----pH meter
----Micropipette: Single-channel 100uL~1000uL
----Disposable glass test tube
----50mL funnel
----Grinder
----Balance: Resolution 0.1g
----Separatory funnel
----Folded filter paper (qualitative or quantitative filter paper)
----Rotary evaporator
----Beakers, volumetric flasks, conical flasks, etc.

----Pump flow operation stand (including air pump, glass syringes with different volumes, etc.)

Reagents:
----Methanol (chromatography grade) ----Acetonitrile (chromatography grade)
----Petroleum ether ----Distilled water or deionized water
----Sodium hydroxide solution (0.5mol/L): Dissolve 2g of sodium hydroxide in 100mL of water

Sample Processing Steps:
(I) Milk:
----Heat 100mL of milk in a water bath to 40°C;
----Centrifuge at 4000 rpm for 15 minutes and collect 50mL of clear supernatant for further use.

(II) Milk powder and powdered infant formula food:
----Weigh 10g of milk powder sample and gradually add 100mL of water at 50°C while stirring to ensure complete dissolution of the milk powder;
----Centrifuge at 6000 rpm for 15 minutes and collect 50mL of clear supernatant for further use.

(III) Fermented milk (including solid, semi-solid, and with pulp types)
----Weigh 60g of thoroughly mixed sample, adjust the pH to 7.4 using a 0.5 moL/L sodium hydroxide solution under the indication of a pH meter;
----Homogenize at 9500r/min for 5 minutes using a high-speed homogenizer;
----Heat in a water bath to 40°C;
----Centrifuge at 4000r/min for 15 minutes, collect 50mL of supernatant for later use.

(IV) Cheese
----Weigh 5g of sample after finely cutting and sieving through a 10-mesh sieve, place it in a 50mL centrifuge tube, add 2mL of water and 30mL of methanol;
----Homogenize at 9500r/min for 5 minutes using a high-speed homogenizer;
----Ultrasonic extraction for 30 minutes;
----Centrifuge at 6000r/min for 15 minutes, collect the supernatant and transfer it into a 250mL separating funnel;
----Add 30mL of petroleum ether (4.3) into the separating funnel, shake for 2 minutes;
----After layering, transfer the lower layer into a 50mL beaker and discard the petroleum ether layer;
----Repeat the extraction with petroleum ether twice;
----Transfer the lower layer solution to a 100mL round-bottom flask, concentrate under reduced pressure to about 2mL;

----Transfer the concentrate into a centrifuge tube, wash the flask twice with 5mL of acetonitrile-water solution (1:4), and pour the washing solution into the 50mL centrifuge tube;
----Dilute with water to about 50mL, centrifuge at 6000r/min for 5 minutes, the supernatant is ready for purification treatment.

(V) Cream
----Weigh 5g of sample, place it in a 50mL beaker;
----Dissolve it in 20mL of petroleum ether and transfer it to a 250mL conical flask;
----Add 20mL of water and 30mL of methanol, shake for 30 minutes, then transfer all the liquid to a separating funnel;
----After layering, transfer all the lower layer solution to a 100mL round-bottom flask, concentrate under reduced pressure to about 5mL in a rotary evaporator, dilute with water to about 50mL, ready for purification treatment.

[Immunoaffinity Column Purification Steps]
----Connect the immunoaffinity column to a 50.0mL glass syringe. Accurately transfer 50.0mL of clear solution into the glass syringe;
----Connect the 50mL glass syringe to an air pressure pump, adjust the pressure to allow the solution to slowly pass through the immunoaffinity column at a flow rate of 2-3mL/min (1-2 drops/s) until 2-3mL of air passes through the column;
----Connect the 10mL glass syringe with the immunoaffinity column, add 10mL of water into the syringe, adjust the pressure to allow water to flow through the immunoaffinity column at a rate of about 6mL/min for washing;
----Accurately add 4mL of chromatography-grade acetonitrile for elution, at a flow rate of 1mL/min~2mL/min, collect all eluate in glass test tubes for detection.

Result Interpretation:
After purification by the immunoaffinity column, the collected acetonitrile eluate can be directly used for detection with a fluorescence spectrophotometer or HPLC, or it can be tested using thin-layer chromatography or enzyme-linked immunosorbent assay (ELISA) kits. The content of aflatoxin M1 in the collected 4mL eluate is equivalent to that in 50mL of milk samples, fermented milk samples, or 5g samples of milk powder, cheese, and cream samples. If other solvents are required for HPLC detection, the acetonitrile eluate can be dried under nitrogen gas and then reconstituted.

Precautions:
----Aflatoxin poses extreme hazards. Gloves should be worn during handling.
----It is recommended to soak glass containers that have been used with aflatoxin solutions in a 5% sodium hypochlorite

solution overnight;
----Do not use immunoaffinity columns that have exceeded their expiration date.

Storage and Preservation:
Storage conditions: Store at 2-8°C, do not freeze.
Shelf life: The product is valid for 18 months.

Aflatoxin Immunoaffinity Column Operation Instructions

Overview:
Aflatoxin is a secondary metabolite produced by fungi such as Aspergillus flavus and Aspergillus parasiticus. Classified by the International Agency for Research on Cancer (IARC) as a Group I carcinogen, aflatoxin is also an extremely toxic substance widely found in various foods. Main sources of aflatoxin include corn, peanuts, rice, wheat, and their by-products. Aflatoxin B1 in feed, after animal metabolism, produces aflatoxin M1, which remains highly toxic and carcinogenic. Aflatoxin is a major factor contributing to liver cancer, as well as gastric and intestinal cancers, posing significant threats to human health. Strict regulations on aflatoxin levels in food and feed are enforced by countries worldwide.

Performance:
Designed for qualitative and quantitative detection of total aflatoxins (B1, B2, G1, G2) in samples of grains, non-staple foods, alcoholic beverages, feed, and other related products.
Column capacity: ≥300ng
Recovery rate: ≥85%

Principle:
The basis of this product's determination is the specific reaction between antigens and antibodies. Aflatoxin Monoclonal antibodies are immobilized on the gel inside the column. Aflatoxins in the sample are extracted, filtered, and diluted. The sample extract is then slowly passed through the aflatoxin immunoaffinity column. Inside the immunoaffinity column, Aflatoxins bind to antibodies. Subsequently, the immunoaffinity column is washed to remove unbound substances. Aflatoxins are eluted with methanol and then injected into an analytical instrument for detection.

Equipment and Reagents:

Equipment:

----High-speed homogenizer or tissue homogenizer ----Grinder

----200mL/50mL graduated cylinders ----Balance: Resolution 0.1g

----Micropipette: Single-channel 100uL~1000uL ----Folded filter paper (qualitative or quantitative filter paper)

----Glass microfiber filter paper (1.5mm pore size) ----50mL funnel

----Disposable glass test tube ----Pump flow operation stand (including air pump, glass syringes with different volumes, etc.)

Reagents:

----Methanol (chromatography grade) ---- Distilled water or deionized water

----Phosphate-buffered saline (PBS, pH 7.0): Weigh 8.0g of sodium chloride, 1.2g of disodium hydrogen phosphate, 0.2g of potassium dihydrogen phosphate, and 0.2g of potassium chloride. Dissolve in 990mL of distilled water, adjust the pH to 7.0 with concentrated hydrochloric acid, and dilute to 1000mL with distilled water.

----Tween-20/PBS solution (0.1%): Take 1mL of Tween-20, add to PBS buffer solution, and make up to 1000mL.

Reagent Preparation:

Prepare methanol-water solutions of varying concentrations according to the specific sample requirements to be used as the sample extraction solution.

Sample Processing Steps:

(I) Peanuts, corn, rice, wheat and their products, vegetable oils, and feed:

----Take 25g of finely ground sample (for vegetable oils, directly sample without processing) and mix with 125mL of methanol-water (7:3) solution;

----Add 5.0g of sodium chloride and homogenize with a high-speed homogenizer for 2 minutes;

----Centrifuge at 4000 rpm for 5 minutes or filter through folded filter paper;

----Take 15mL of filtrate and add 30mL of water for dilution, then filter through glass microfiber filter paper;

----The diluted liquid is ready for testing;

----Connect the immunoaffinity column to a 20.0mL syringe. Accurately transfer 15.0mL of sample extraction solution into the syringe;

----Connect the syringe to an air pressure pump and adjust the pressure to allow the solution to flow slowly through the immunoaffinity column at a rate of about 6mL/min (1-2 drops/s) until 2-3mL of air passes through the column;

----Rinse the column twice with 10.0mL of water, discard all the effluent, and let 2mL~3mL of air pass through the column;

----Accurately add 1.0mL of chromatography-grade methanol for elution, at a flow rate of 1mL/min~2mL/min (less than 1 drop/s), collect all eluate in glass test tubes for detection.

(II) Vinegar
----Take 5g of sample and add 1.0g of sodium chloride;
----Dilute with pH 7.0 phosphate buffered solution to a final volume of 25.0mL;
----Centrifuge at 4000 rpm for 5 minutes or filter through folded filter paper;
----Take 10mL of filtrate and dilute with 10mL of water, then filter through glass microfiber filter paper.

(III) Traditional Chinese Medicine
----Take 15g of finely powdered sample (passed through a No. 2 sieve) and mix with 75mL of methanol-water (7:3) solution;
----Add 3.0g of sodium chloride and homogenize with a high-speed homogenizer for 2 minutes;
----After centrifuging at 2500 rpm for 3 minutes, take 15mL of filtrate and transfer it into a 50mL volumetric flask. Dilute to volume with water and filter through glass microfiber filter paper;
----Connect the immunoaffinity column to a 20.0mL syringe. Accurately transfer 20.0mL of sample extraction solution into the syringe;
----Connect the syringe to an air pressure pump and adjust the pressure to allow the solution to flow slowly through the immunoaffinity column at a rate of about 3mL/min (1-2 drops/s) until 2-3mL of air passes through the column;
----Wash the column twice with 10.0mL of water. Discard all the effluent, and let 2mL~3mL of air pass through the column;
----Add approximately 1.0mL of chromatography-grade methanol for elution, at a flow rate of 1mL/min~2mL/min (less than 1 drop/s), and collect all eluate in a 2mL brown volumetric flask. Dilute to volume with methanol for detection.

Result Interpretation:
After purification with the immunoaffinity column, the collected methanol eluate can be directly used for detection with a fluorescence spectrophotometer or HPLC, or it can be tested using thin-layer chromatography or enzyme-linked immunosorbent assay (ELISA) kits. The aflatoxin content in 1mL of collected eluate is equivalent to the aflatoxin content in 1g of sample (note: due to the use of pharmacopoeia method, it is equivalent to only 0.6g of sample).

Precautions:
----Aflatoxin poses extreme hazards. Gloves should be worn during handling.
----It is recommended to soak glass containers that have been used with aflatoxin solutions in a 5% sodium hypochlorite

solution overnight.

Storage and Preservation:
Store at 2-8°C, do not freeze.
Shelf Life: The product is valid for 18 months.

Deoxynivalenol Immunoaffinity Column Operation Instructions

Overview:

Deoxynivalenol (DON), also known as vomitoxin, is primarily a toxic metabolite produced by certain species of Fusarium fungi. It is widely distributed globally and mainly contaminates cereals such as wheat, barley, and corn, as well as cereal products. Humans and animals can suffer from extensive toxic effects after ingesting grains contaminated with this toxin. The most evident toxic effects of DON include inducing symptoms such as vomiting, diarrhea, and abdominal pain, while also causing growth retardation and immune suppression. It is closely associated with conditions such as anemia, immunosuppression, esophageal cancer, and Kashin-Beck disease. It poses a significant threat to the health of humans and livestock.

Performance:
Designed for sample pre-treatment in the qualitative and quantitative detection of deoxynivalenol in food and feed samples such as grains and alcoholic beverages.
Column capacity: ≥1500ng
Recovery rate: ≥80%

Principle:
The basis of this product's determination is the specific reaction between antigens and antibodies. Deoxynivalenol monoclonal antibodies are immobilized on the gel inside the column. Deoxynivalenol in the sample is extracted, filtered, and diluted. The sample extract is then slowly passed through the Deoxynivalenol immunoaffinity column. Inside the immunoaffinity column, Deoxynivalenol binds to antibody. Subsequently, the immunoaffinity column is washed to remove unbound substances. Deoxynivalenol is eluted with methanol and then injected into an analytical instrument for detection.

Equipment and Reagents:
Equipment:

----High-speed homogenizer or tissue homogenizer ----Grinder
----200mL/50mL graduated cylinders ----Balance: Resolution 0.1g
----Micropipette: Single-channel 100uL~1000uL ----Folded filter paper (qualitative or quantitative filter paper)
----Glass microfiber filter paper (1.5mm pore size) ----Disposable glass test tube
----50mL funnel ----Pump flow operation stand (including air pump, glass syringes with different volumes, etc.)

Reagents:

----Distilled water or deionized water ----Polyethylene glycol (PEG) 8000
----Chromatography-grade methanol
----Phosphate-buffered saline (PBS, pH 7.0): Weigh 8.0g of sodium chloride, 1.2g of disodium hydrogen phosphate, 0.2g of potassium dihydrogen phosphate, and 0.2g of potassium chloride. Dissolve in 990mL of distilled water, adjust the pH to 7.0 with concentrated hydrochloric acid, and dilute to 1000mL with distilled water.

Sample Processing Steps:

(I) Peanuts, corn, rice, wheat and their products, and feed (dilution factor 4)
----Weigh 25g finely ground sample, add 10g of polyethylene glycol 8000, and make up to 200mL with deionized water;
----Transfer to a homogenizer cup, homogenize at high speed for 2 minutes;
----Centrifuge at 4000 rpm for 5 minutes or filter through quantitative filter paper, collect the supernatant, and filter again using glass fiber filter paper for later use;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 2mL of the above sample extract into the glass syringe;
----Connect the air pressure pump to the glass syringe, adjust the pressure to allow the solution to flow slowly through the immunoaffinity column at a rate of about 1 drop/s until 2~3mL of air passes through the column;
----Rinse the column once with 5.0mL of PBS solution and deionized water at a flow rate of 2-3 drops/5 seconds. Discard all the effluent and pass 2mL~3mL of air through the column;
----Accurately add 1.0mL of chromatography-grade methanol eluent, collect all eluted solution in a glass test tube for testing.

(II)Alcoholic beverages (dilution factor 0.5)
----Take the degassed alcoholic sample (the sample containing carbon dioxide should be refrigerated at 4°C for 30 minutes before use, and be filtered or degassed by ultrasound) or other non-carbon dioxide sample 20g (accurate to 0.01g), add 1g polyethylene glycol (4.3), and make up to 25mL with deionized water;

----Filter with glass fiber filter paper until the filtrate is clarified;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 2mL of the above sample extract into the glass syringe;
----Connect the air pressure pump to the glass syringe, adjust the pressure to allow the solution to flow slowly through the immunoaffinity column at a rate of about 1 drop/s until 2~3mL of air passes through the column;
----Rinse the column once with 5.0mL of PBS solution and deionized water at a flow rate of 2-3 drops/5 seconds. Discard all the effluent and pass 2mL~3mL of air through the column;
----Accurately add 1.0mL of chromatography-grade methanol eluent, collect all eluted solution in a glass test tube for testing.

Result Interpretation:
After purification by the immunoaffinity column, the collected methanol eluate can be directly used for detection with a fluorescence spectrophotometer or HPLC, or it can be tested using thin-layer chromatography or enzyme-linked immunosorbent assay (ELISA) kits. It can also be dried with nitrogen gas and re-dissolved to increase the concentration (corresponding dilution factor changes).

Precautions:
----Vomitoxin poses extreme hazards. Gloves should be worn during handling.
----Do not use immunoaffinity columns that have exceeded their expiration date.

Storage and Preservation:
Storage Conditions: Store at 2-8°C, do not freeze.
Shelf Life: The product is valid for 18 months.

Zearalenone Immunoaffinity Column Operation Instructions

Overview:
Zearalenone, also known as F-2 toxin, is a metabolite of Fusarium fungi. It exhibits estrogenic effects and possesses strong reproductive toxicity and teratogenic effects. It can cause animals to develop estrogenic syndrome, leading to infertility or miscarriage, which significantly impacts poultry, pigs, cattle, and sheep, causing considerable economic losses to the livestock industry.

Performance:
Designed for sample pre-treatment in the qualitative and quantitative detection of zearalenone in grains, alcoholic beverages, and feed samples.
Column Capacity: ≥1500ng
Recovery Rate: ≥90%

Principle:
The basis of this product's determination is the specific reaction between antigens and antibodies. Zearalenone monoclonal antibodies are immobilized on the gel inside the column. Zearalenone in the sample is extracted, filtered, and diluted. The sample extract is then slowly passed through the Zearalenone immunoaffinity column. Inside the immunoaffinity column, Zearalenone binds to antibodies. Subsequently, the immunoaffinity column is washed to remove unbound substances. Zearalenone is eluted with methanol and then injected into an analytical instrument for detection.

Equipment and Reagents:
Equipment:
----High-speed homogenizer or tissue homogenizer ----Grinder
----200mL/50mL graduated cylinders ----Balance: Resolution 0.1g
----Micropipette: Single-channel 100uL~1000uL ----Folded filter paper (qualitative or quantitative filter paper)
----Glass microfiber filter paper (1.5mm pore size) ----Disposable glass test tube
----50mL funnel ----Pump flow operation stand (including air pump, glass syringes with different volumes, etc.)

Reagents:
----Distilled water or deionized water ----Chromatography-grade methanol
----Phosphate-buffered saline (PBS, pH 7.0): Weigh 8.0g of sodium chloride, 1.2g of disodium hydrogen phosphate, 0.2g of potassium dihydrogen phosphate, and 0.2g of potassium chloride. Dissolve in 990mL of distilled water, adjust the pH to 7.0 with concentrated hydrochloric acid, and dilute to 1000mL with distilled water.

Reagent preparation:
Prepare a methanol-water (8:2) solution as the sample extraction solution.

Sample processing steps:
(I) Peanuts, corn, rice, wheat and their products and feed
----Weigh 50g of ground sample into a 100mL volumetric flask, add 5.0g of sodium chloride, and make up to volume with

sample extraction solution;
----Transfer to a homogenizing cup, homogenize at high speed for 2 minutes;
----Centrifuge at 4000r/min for 5 minutes or filter through quantitative filter paper;
----Take 10mL of filtrate and add 40mL of PBS buffer for dilution, filter with glass microfiber filter paper, and the filtered liquid is ready for testing;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 10.0mL of sample extraction solution into the glass syringe;
----Connect the air pressure pump to the glass syringe, adjust the pressure to allow the solution to slowly pass through the immunoaffinity column at a rate of about 1 drop/s, until 2~3mL of air passes through the column;
----Rinse the column sequentially with 10.0mL of PBS solution and deionized water, with a flow rate of about 1-2 drops/s, discard all effluent, and allow 2mL~3mL of air to pass through the column;
----Accurately add 1.0mL of chromatographic grade methanol eluent, collect all eluate in a glass test tube for testing.

(II) Beer, yellow rice wine, and other alcoholic beverages:
----Take 10mL of degassed sample and mix with 90mL of PBS buffer, filter through glass microfiber filter paper, and collect the filtered liquid for testing;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 10.0mL of the sample extract into the glass syringe;
----Connect the air pressure pump to the glass syringe and adjust the pressure to allow the solution to pass through the immunoaffinity column at a rate of approximately 1 drop/s until 2-3mL of air passes through the column;
----Wash the column once with 10.0mL of PBS solution and deionized water sequentially, with a flow rate of approximately 1-2 drops/s. Discard all effluent and allow 2mL~3mL of air to pass through the column;
----Accurately add 1.0mL of chromatography-grade methanol eluent at a flow rate of 1 drop/s, collect all eluate in a glass test tube for analysis.

Results Interpretation:
After purification by the immunoaffinity column, the collected methanol eluate can be directly used for detection with a fluorescence spectrophotometer or HPLC, or it can be tested using thin-layer chromatography or enzyme-linked immunosorbent assay (ELISA) kits. The content of zearalenone in the collected 1mL eluate is equivalent to the zearalenone content in 1g of the sample.

Precautions:
----Zearalenone poses extreme hazards. Gloves should be worn during handling.

----Do not use immunoaffinity columns that have exceeded their expiration date.

Storage and Preservation:
Storage conditions: Store at 2-8°C, do not freeze.
Shelf life: The product is valid for 18 months.

Ochratoxin A Immunoaffinity Column Operation Instructions

Overview:
Ochratoxin A (OTA) is a secondary metabolite produced by fungi of the Aspergillus and Penicillium genera. It is a nephrotoxic and hepatotoxic substance that is widely present in various foods, with grains and their by-products being the main sources of Ochratoxin A. Animal experiments have shown that ingestion of feed contaminated with this toxin can lead to acute or chronic poisoning. It is crucial to strengthen the detection of Ochratoxin A to prevent contaminated food and feed from directly or indirectly entering the human food chain.

Performance:
Designed for sample pre-treatment in qualitative and quantitative detection of Ochratoxin A in samples such as grains, alcoholic beverages, Chinese herbal medicines, food, and feed.
Column capacity: ≥200ng
Recovery rate: ≥90%

Principle:
The basis of this product's determination is the specific reaction between antigens and antibodies. Ochratoxin A monoclonal antibodies are immobilized on the gel inside the column. Ochratoxin A in the sample is extracted, filtered, and diluted. The sample extract is then slowly passed through the Ochratoxin A immunoaffinity column. Inside the immunoaffinity column, Ochratoxin A binds to antibodies. Subsequently, the immunoaffinity column is washed to remove unbound substances. Ochratoxin A is eluted with methanol and then injected into an analytical instrument for detection.

Equipment and Reagents:
Equipment:
----High-speed homogenizer or tissue homogenizer
----200mL/50mL graduated cylinders
----Micropipette: Single-channel 100uL~1000uL
----Grinder
----Balance: Resolution 0.1g
----Folded filter paper (qualitative or quantitative filter paper)

----Glass microfiber filter paper (1.5mm pore size) ----Disposable glass test tube
----50mL funnel ----Pump flow operation stand (including air pump, glass syringes with different volumes, etc.)

Reagents:

----Distilled water or deionized water ----Chromatography-grade methanol
----Chromatography-grade acetic acid
----Phosphate-buffered saline (PBS, pH 7.0): Weigh 8.0g of sodium chloride, 1.2g of disodium hydrogen phosphate, 0.2g of potassium dihydrogen phosphate, and 0.2g of potassium chloride. Dissolve in 990mL of distilled water, adjust the pH to 7.0 with concentrated hydrochloric acid, and dilute to 1000mL with distilled water.
----Washing Buffer Solution: 25g sodium chloride+5g sodium bicarbonate+0.1mL Tween-20 diluted to 1000mL with pure water

Reagent Preparation:

Prepare a solution of methanol-water (8:2) as the sample extraction solution.

Sample Processing Steps:

(I) Peanuts, corn, rice, wheat and their products and feed (dilution factor 2.5)
----Weigh 20g of ground sample into a 100mL volumetric flask, add 5.0g of sodium chloride, and fill up to 100mL with methanol-water (8:2) solution;
----Transfer to a homogenizer cup, homogenize at high speed for 2 minutes;
----Centrifuge at 4000 rpm for 5 minutes or filter using quantitative filter paper;
----Take 10mL of the filtrate and add 40mL of PBS buffer for dilution, filter through glass microfiber filter paper, and the filtered liquid is ready for measurement;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 10.0mL of the sample extraction solution into the glass syringe;
----Connect the air pressure pump to the glass syringe, adjust the pressure to allow the solution to pass slowly through the immunoaffinity column at a rate of about 1 drop/s until 2~3mL of air passes through the column;
----Rinse the column once with 10.0mL of washing buffer solution at a flow rate of 1-2 drops/s, discard all the eluate;
----Rinse the column once with 10.0mL of water at a flow rate of 1-2 drops/s, discard all the eluate, and allow 2mL~3mL of air to pass through the column;
----Accurately add 1.0mL of 2% acetic acid methanol solvent eluent at a flow rate of 1 drop/s, collect all the eluate in a glass test tube for detection.

(II) Beer, rice wine and other alcoholic beverages (dilution factor 1)

----Take 10mL of degassed sample and mix it with 90mL of PBS buffer, filter through glass microfiber filter paper, and the filtered liquid is ready for measurement;
----Connect the immunoaffinity column to a 10.0mL glass syringe. Accurately transfer 10.0mL of the sample extraction solution into the glass syringe;
----Connect the air pressure pump to the glass syringe, adjust the pressure to allow the solution to pass slowly through the immunoaffinity column at a rate of about 1 drop/s until 2mL~3mL of air passes through the column;
----Rinse the column once with 10.0mL of washing buffer solution at a flow rate of 1-2 drops/s, discard all the eluate;
----Rinse the column once with 10.0mL of water at a flow rate of 1-2 drops/s, discard all the eluate, and allow 2mL -3mL of air to pass through the column;
----Accurately add 1.0mL of 2% acetic acid methanol solvent eluent at a flow rate of 1 drop/s, collect all the eluate in a glass test tube for detection.

Results Interpretation:
After purification by the immunoaffinity column, the collected methanol eluate can be directly used for detection with a fluorescence spectrophotometer or HPLC, or it can be tested using thin-layer chromatography or enzyme-linked immunosorbent assay (ELISA) kits.

Precautions:
----Ochratoxin poses extreme hazards. Gloves should be worn during handling.
----Do not use immunoaffinity columns that have exceeded their expiration date.

Storage and Preservation:
Storage conditions: Store at 2-8°C, do not freeze.
Shelf life: The product is valid for 18 months.

2. Welchrom® Immunoaffinity Column Ordering Information

P/N	Product Name	Specifications	P/N	Product Name	Specifications
01140-00031	Total Aflatoxin (B1, B2, G1, G2)	1mL, 25pcs	01140-04031	Zearalenone	1mL, 25pcs
01140-00032	Total Aflatoxin (B1, B2, G1, G2)	3mL, 15pcs	01140-04032	Zearalenone	3mL, 15pcs
01140-01031	Total Aflatoxin (B1, B2, G1, G2, M1)	1mL, 25pcs	01140-02031	Vomitoxin (DON)	1mL, 25pcs

P/N	Product Name	Specifications	P/N	Product Name	Specifications
01140-01032	Total Aflatoxin (B1, B2, G1, G2, M1)	3mL, 15pcs	01140-02032	Vomitoxin (DON)	3mL, 15pcs
01140-05031	Aflatoxin B1	1mL, 25pcs	01140-06031	Ochratoxin	1mL, 25pcs
01140-05032	Aflatoxin B1	3mL, 15pcs	01140-06032	Ochratoxin	3mL, 15pcs
01140-03031	Aflatoxin M1	1mL, 25pcs	01140-07032	Fumonisins	3mL, 15pcs
01140-03032	Aflatoxin M1	3mL, 15pcs	01140-08032	T-2 mycotoxin	3mL, 15pcs

Note: please contact Welch or your local distributor for more dimensions.

3. Related Products

3.1 SPE Manifold

Features:

1. The vacuum glass chamber facilitates real-time monitoring of the extraction process and can undergo 121°C heat sterilization treatment for easy cleaning.
2. Optimization of sample flow rate using vacuum gauge and exhaust valve.
3. Equipped with a variety of aperture support discs to accommodate most sampling tubes; support stand with multiple gear positions for freely adjustable disc height.
4. The bottom is specially equipped with a tray to protect the glass vacuum chamber from abrasion.
5. Each path is equipped with an inlet control valve to adjust the flow rate according to experimental requirements.

Technical Parameters:

Dimensions: 200×100×170mm/300×100×170mm
Pressure resistance: 80kPa
Simultaneous processing capacity: 12/24 samples

Product List:

1. Cover plate support rods: 4 pcs
2. Flow control valves (Stopcocks): 12 or 24 pcs
3. Pressure vacuum gauge: 1 piece
4. Test tube rack positioning C-clips: 12 pcs
5. Waste liquid collection tank: 1 pcs
6. Diversion needles: 12 or 24 pcs

7. Test tube rack set (7 pcs or 9 pcs)

Ordering information:

P/N	Name	Specifications	Note
00824-31001	SPE manifold	SPE manifold, 12 ports, 1pk	Standard
00824-32001	SPE manifold	SPE manifold, 24 ports, 1pk	Standard
00824-11001	SPE Accessories	SPE Stopcock Valves(Flow Control), 12pk	Optional
00824-20005*12	SPE Accessories	SPE connector, 12pk	Optional
SPE-P12	SPE Accessories	PTFE Tubing, 1/8" OD, 1/16" ID, 1m×6pk	Optional
SPE-B12	SPE Accessories	Large Capacity Sample Loader 60mL, 12pk	Optional

3.2 Oil-Free Vacuum Pump

Product Introduction:

Doprah A900265 vacuum pump is an important filtration accessory designed to enhance filtration efficiency and strengthen degassing effects. To ensure that the filtration medium is not contaminated, oil-free diaphragm vacuum pumps are commonly used. This type of pump operates by the reciprocating movement of a rubber diaphragm to create a vacuum, with a vacuum pressure typically around 0.08 MPa (single-stage). The A900265 oil-free vacuum pump is specifically designed to support various vacuum equipment needs in laboratories. It can be used for vacuum concentration, vacuum filtration, vacuum drying, and other applications.

Features:

1. Provides sufficient motor power to reduce motor heating.
2. The vacuum membrane is made of high-quality rubber with good oil resistance and fatigue resistance. It is reinforced with a textile framework interlayer, with a thickness of 3mm, greatly improving its service life.
3. Compact and practical, easy to operate, high efficiency, low noise.
4. Optional pressure regulation form and exhaust valve configuration.

Technical Parameters

Model	A900265	Filter Bottle Capacity	1000mL
Flow Rate	26L/min	Voltage	AC 220V/110V 50Hz/60Hz
Vacuum Degree	0.08MPA	Power	60W
Negative Pressure Adjustment Range	0-0.08 MPa		

Ordering Information

P/N	Name	Specifications
A900265	Oil-Free Vacuum Pump	Adjustable 0-0.08 MPa, 1000mL, 1pk

3.3 Pump Flow Operation Rack

The pump flow operation rack is a simple and user-friendly system designed to assist in the use of immunoaffinity columns. It also provides a series of accessories that complement the immunoaffinity column rack. The pump flow operation rack consists of 8 of operation frames, 8 of connectors, 1 of dual-head ultra-quiet air pump, 8 of 10mL glass syringes, and several plastic tubes. It is constructed with robust and chemically resistant materials, specifically designed to handle multiple immunoaffinity column racks simultaneously, allowing for the simultaneous processing of 8 immunoaffinity columns, significantly improving processing efficiency. Moreover, the detachable and portable nature of this operation rack provides experimenters with more flexibility and space for experimentation.

Features:

1. Capable of simultaneously processing multiple immunoaffinity columns, enhancing efficiency.
2. The rack system is easy to move, suitable for use in various parts of the laboratory.
3. Sturdy, durable, and resistant to chemical substances.
4. The size of the rack is suitable for convenient use.
5. Easy to clean and disinfect.

Technical Parameters:

Dual-head ultra-quiet air pump, pressure: >0.012 MPa, exhaust volume: 7.2 L/min.

Ordering Information:

P/N	Name	Specifications
00824-33001	Pump Flow Operation Rack	8 positions (including air pump)