VibrantWellness
1360 Bayport Ave, Ste B. San Carlos, CA 94070
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Final Report Date:	08-26-2020 14:56	**Specimen Collected:**	08-25-2020 14:55
Accession ID:	2008260002	**Specimen Received:**	08-26-2020 08:56

LAST NAME	FIRST NAME	GENDER	DATE OF BIRTH	ACCESSION ID	DATE OF SERVICE
PATIENT	TEST	MALE	1998-03-15	2008260002	08-25-2020 14:55

PATIENT

Name: TEST PATIENT
Date of Birth: 1998-03-15
Gender: Male
Age: 22

Fasting: FASTING

PROVIDER

Practice Name: Vibrant IT4 Practice
Provider Name: Demo Client, DDD (999994)
Street Address: TEST STREET
City: TEST CITY
State: KY
Zip #: 42437
Telephone #:
Fax #: 000-000-0000
Phlebotomist: 608

Vibrant Wellness is pleased to present to you, '**Mycotoxins**', to help you make healthy lifestyle, dietary and treatment choices in consultation with your healthcare provider. It is intended to be used as a tool to encourage a general state of health and well-being.

The Vibrant Mycotoxins is a test to identify and quantify the level of a large set of mycotoxins from both food and environmental molds. The panel is designed to give a complete picture of an individual's levels of these mycotoxins in urine. The results are provided in 3 tables subgrouping the mycotoxins into Aflatoxins, Trichothecenes and Other Mycotoxins

Interpretation of Report: The report begins with the Mycotoxins summary page which lists only the mycotoxins whose levels are high or moderate in the reference range. Following this section is the complete list of the mycotoxins along with the corresponding species and their levels normalized to urinary creatinine, in a tabular form to enable a full overview along with the reference ranges. The level of the mycotoxin has a green, yellow or red highlight around the cell indicating – Mild (Low mold diet intake), Moderate or High exposure to the particular mycotoxin. Additionally, the previous value is also indicated to help check for improvements every time the test is ordered.

The Vibrant Wellness platform provides tools for you to track and analyze your general wellness profile. Testing for the Mycotoxins panel is performed by Vibrant America, a CLIA certified lab CLIA#:05D2078809. Vibrant Wellness provides and makes available this report and any related services pursuant to the Terms of Use Agreement (the "Terms") on its website at www.vibrant-wellness.com. By accessing, browsing, or otherwise using the report or website or any services, you acknowledge that you have read, understood, and agree to be bound by these terms. If you do not agree to accept these terms, you shall not access, browse, or use the report or website. The statements in this report have not been evaluated by the Food and Drug Administration and are only meant to be lifestyle choices for potential risk mitigation. Please consult your physician/dietitian for medication, treatment, or lifestyle management. This product is not intended to diagnose, treat, or cure any disease.

Please Note - It is important that you discuss any modifications to your diet, exercise and nutritional supplementation with your physician before making any changes.

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Mycotoxins Summary

Mycotoxins - High

Test Name	Species Name	In Control	Moderate	High	Current Level	Previous Level (08/26/2020)
Sterigmatocystin (ng/g)	Aspergillus, Penicillium, Bipolaris	≤0.40	0.41~0.80	≥0.81	7.77	6.55
Zearalenone (ng/g)	Fusarium	≤0.50	0.51~1.00	≥1.01	3.41	3.19
Enniatin B1 (ng/g)	Fusarium	≤0.10	0.11~0.40	≥0.41	3.70	3.08
Roridin E (ng/g)	Fusarium, Myrothecium, Stachybotrys	≤1.00	1.01~2.00	≥2.01	5.72	6.11
Verrucarin A (ng/g)	Fusarium, Myrothecium, Stachybotrys	≤1.00	1.01~2.00	≥2.01	7.97	5.03
Nivalenol (NIV) (ng/g)	Fusarium	≤2.40	2.41~4.80	≥4.81	5.81	3.80
diacetoxyscirpenol (DAS) (ng/g)	Fusarium	≤3.20	3.21~6.40	≥6.41	7.85	4.80
T-2 toxin (ng/g)	Fusarium	≤0.10	0.11~0.30	≥0.31	4.18	3.83
Satratoxin G (ng/g)	Stachybotrys chartarum	≤0.10	0.11~0.30	≥0.31	5.96	5.90
Satratoxin H (ng/g)	Stachybotrys chartarum	≤0.10	0.11~0.30	≥0.31	5.80	4.14
Isosatratoxin F (ng/g)	Stachybotrys chartarum	≤0.10	0.11~0.30	≥0.31	3.73	7.72
Urine Creatinine (mg/ml)		0.25~2.16		≤0.24 ≥2.17	5.20	5.85

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Mycotoxins - Moderate

Test Name	Species Name	In Control	Moderate	High	Current Level	Previous Level (08/26/2020)
Aflatoxin M1 (ng/g)	Aspergillus	≤4.80	4.81~9.60	≥9.61	5.64	4.49
Aflatoxin G1 (ng/g)	Aspergillus	≤4.90	4.91~9.80	≥9.81	6.10	5.89
Ochratoxin A (ng/g)	Aspergillus, Penicillium	≤5.10	5.11~10.20	≥10.21	6.97	7.59
Fumonisins B2 (ng/g)	Fusarium	≤5.40	5.41~10.80	≥10.81	6.55	3.42
Roridin H (ng/g)	Stachybotrys chartarum	≤6.30	6.31~12.60	≥12.61	7.11	5.62
Roridin L-2 (ng/g)	Stachybotrys chartarum	≤5.10	5.11~10.20	≥10.21	5.58	7.53

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Mycotoxins Complete List

Aflatoxin

Test Name (ng/g)	Species Name	In Control	Moderate	High	Current Level	Previous Level (08/26/2020)
Aflatoxin M1	Aspergillus	≤4.80	4.81~9.60	≥9.61	5.64	4.49
Aflatoxin B1	Aspergillus	≤5.20	5.21~10.40	≥10.41	5.16	3.02
Aflatoxin B2	Aspergillus	≤6.10	6.11~12.20	≥12.21	5.94	5.70
Aflatoxin G1	Aspergillus	≤4.90	4.91~9.80	≥9.81	6.10	5.89
Aflatoxin G2	Aspergillus	≤8.10	8.11~16.20	≥16.21	5.89	7.88

Comments

Aflatoxin M1

Aflatoxins are secondary metabolites produced by different strains Aspergillus species, widely found as contaminants in a great variety of crops—cereals, oilseeds, tree nuts and spices. Among these toxins, Aflatoxin M1 (AFM1) is the principal hydroxylated aflatoxin metabolite of Aflatoxin B1 (AFB1), the most recurrent and most harmful aflatoxin present in the milk of dairy cows fed a diet contaminated with AFB1. Carry-over of AFB1 as AFM1 in the milk of dairy cows has been established to range from 0.3% to 6.2%. Due to the high stability of AFM1 towards milk processing technologies, such as pasteurization, ultra-high temperature heating (UHT), and other processing methods, this mycotoxin can be found not only in milk, but also in dairy products, usually at higher concentration than that found in raw milk. In addition, AFM1 is found in human breast milk too. This mycotoxin has become a real public health concern, especially for infants and young children. It is considered that infants are more exposed to AFM1 contamination by breast milk intake than that using infant formula.[1] Moreover, international agency for research on cancer (IARC) classified AFB1 and AFM1 as human carcinogens belonging to Group 1 and Group 2B, respectively.[2]

Aflatoxin G1

Aflatoxins are naturally occurring Mycotoxins that are produced by Aspergillus species of fungi. Aflatoxin G1 (AFG1) is one of the four major naturally known aflatoxins produced by the Aspergillus species. Aflatoxins may be present in a wide range of food commodities, particularly cereals, oil seeds, spices and tree nuts like maize, groundnuts (peanuts), pistachios, chilies, black pepper, dried fruit and figs etc. It has also been detected in milk and milk products. Less is known about the chronic toxicity of aflatoxin G1, but these are also thought to be carcinogens, though probably a little less potent than B1.

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Other

Test Name (ng/g)	Species Name	In Control	Moderate	High	Current Level	Previous Level (08/26/2020)
Ochratoxin A	Aspergillus, Penicillium	≤5.10	5.11~10.20	≥10.21	6.97	7.59
Sterigmatocystin	Aspergillus, Penicillium, Bipolaris	≤0.40	0.41~0.80	≥0.81	7.77	6.55
Zearalenone	Fusarium	≤0.50	0.51~1.00	≥1.01	3.41	3.19
Enniatin B1	Fusarium	≤0.10	0.11~0.40	≥0.41	3.70	3.08
Fumonisins B1	Fusarium	≤4.60	4.61~9.20	≥9.21	3.65	6.43
Fumonisins B2	Fusarium	≤5.40	5.41~10.80	≥10.81	6.55	3.42
Fumonisins B3	Fusarium	≤8.10	8.11~16.20	≥16.21	3.91	7.91
Citrinin	Penicillium	≤9.40	9.41~18.80	≥18.81	3.06	3.25
Patulin	Penicillium	≤8.70	8.71~17.40	≥17.41	5.47	7.64
Gliotoxin	Aspergillus	≤155.90	155.91~311.80	≥311.81	6.18	6.13
Mycophenolic Acid	Aspergillus, Penicillium	≤4.80	4.81~9.60	≥9.61	3.74	6.37
Dihydrocitrinone	Aspergillus, Penicillium, Monascus	≤12.40	12.41~24.80	≥24.81	7.93	5.34
Chaetoglobosin A	Chaetomium globosum	≤23.90	23.91~47.80	≥47.81	7.82	7.74

Comments

Ochratoxin A

Members of the ochratoxin A have been found as metabolites of many different species of Aspergillus and Penicillium. The level of Ochratoxin A production also influenced by the substrate on which the molds grow as well as the moisture level, temperature, and presence of competitive microflora interact to influence the level of toxin produced. Ochratoxin A has been found in barley, oats, rye, wheat, coffee beans, and other plant products, with barley having a particularly high likelihood of contamination. Ochratoxin has been detected in blood and other animal tissues and in milk, including human milk. Ochratoxin A is a nephrotoxin to all animal species studied to date and is most likely toxic to humans, who have the longest half-life for its elimination of any of the species. It is frequently found in pork intended for human consumption. Ochratoxin is believed to be responsible for a porcine nephropathy that has been studied intensively in the Scandinavian countries. The disease is endemic in Denmark, where rates of porcine nephropathy and ochratoxin contamination in pig feed are highly correlated. In addition to being a nephrotoxin, animal studies indicate that ochratoxin A is a liver toxin, an immune suppressant, a potent teratogen, and a carcinogen.[3]

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Sterigmatocystin

Sterigmatocystin, a related dihydrofuran toxin, is a late metabolite in the aflatoxin pathway and is also produced as a final biosynthetic product by a number of species such as Aspergillus Penicillium, and Bipolaris. STC is a possible human carcinogen (2B) according to IARC classification and showed immunotoxic and immunomodulatory activity, together with mutagenic effects. It might be found in numerous substrates, from foods and feeds to chronically damp building materials and indoor dust. Due to the structural similarities, aflatoxins and STC share relevant toxic effects, including genotoxicity and carcinogenicity. However, in contrast to aflatoxins, only limited information on occurrence and toxicity of STC is available. Liver and kidneys are the target organs of acute toxicity of STC. However, the acute oral toxicity is relatively low (range between 120 and 166 mg/kg body weight).[4]

Zearalenone

Zearalenone (ZEA) is a non-steroidal estrogenic mycotoxin. It is produced principally by Fusarium molds, and consequently occurs wherever DON occurs, most notably as a contaminant of maize, wheat, barley, oats, rye, sorghum, millet, and rice. ZEA and its metabolites can bind to estrogen receptors, resulting in various changes in the reproductive organs. In addition, however, ZEA is a competitive substrate for enzymes involved in steroid synthesis and metabolism and therefore has the potential to act as an endocrine disruptor.[5]

Enniatin B1

Mycotoxin enniatin B (ENN B) is a secondary metabolism product by Fusarium fungi. It is a well-known antibacterial, antihelmintic, antifungal, herbicidal, and insecticidal compound. It has been found as a contaminant in cereal grains, animal feeds and several food commodities worldwide, co-occurring with other mycotoxins. Moreover, they are commonly found in fish, dried fruits, nuts, spices, cocoa, coffee products, etc. Food processing techniques such as cooking, baking, frying, roasting, etc. do not affect their chemical structure; so, detoxification strategies to mitigate the risks of ENNs presence in foods and feed may be difficult. Several in vitro and in vivo studies have revealed that ENN B toxicity involves the inhibition of acyl-CoA: cholesterol acyl transferase (ACAT) activity and oxidative stress. ENN B also exerts cytotoxic activities by inducing mitochondrial modifications and cell cycle disruption, finally resulting in apoptotic cell death. Moreover, it produces adrenal endocrine toxicity. A recent study reports a potential anticancer activity. Nevertheless, regulatory limits have not yet been defined, due to a lack of complete toxicity data.[8]

Fumonisins B2

Fumonisin B2 is a mycotoxin produced by Fusarium growing on moldy corn (maize) grain. FB2 and Fumonisin B3 (FB3) occur in lower concentrations than FB1. FB1 and FB2 are approximately equal in structure and toxicity but naturally occur in a ratio of about 3:1 for FB1/FB2, thus has less toxicity than FB1.[9]

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Trichothecenes

Test Name (ng/g)	Species Name	In Control	Moderate	High	Current Level	Previous Level (08/26/2020)
Roridin E	Fusarium, Myrothecium, Stachybotrys	≤1.00	1.01~2.00	≥2.01	5.72	6.11
Verrucarin A	Fusarium, Myrothecium, Stachybotrys	≤1.00	1.01~2.00	≥2.01	7.97	5.03
Deoxynivalenol (Vomitoxin/DON)	Fusarium	≤50.60	50.61~101.20	≥101.21	4.26	4.50
Nivalenol (NIV)	Fusarium	≤2.40	2.41~4.80	≥4.81	5.81	3.80
diacetoxyscirpenol (DAS)	Fusarium	≤3.20	3.21~6.40	≥6.41	7.85	4.80
T-2 toxin	Fusarium	≤0.10	0.11~0.30	≥0.31	4.18	3.83
Satratoxin G	Stachybotrys chartarum	≤0.10	0.11~0.30	≥0.31	5.96	5.90
Satratoxin H	Stachybotrys chartarum	≤0.10	0.11~0.30	≥0.31	5.80	4.14
Isosatratoxin F	Stachybotrys chartarum	≤0.10	0.11~0.30	≥0.31	3.73	7.72
Roridin A	Stachybotrys chartarum	≤5.70	5.71~11.40	≥11.41	3.57	3.47
Roridin H	Stachybotrys chartarum	≤6.30	6.31~12.60	≥12.61	7.11	5.62
Roridin L-2	Stachybotrys chartarum	≤5.10	5.11~10.20	≥10.21	5.58	7.53
Verrucarin J	Stachybotrys chartarum	≤6.90	6.91~13.80	≥13.81	6.70	6.70

Comments

Roridin E
Roridin E is a well-known macrocyclic trichothecene mycotoxin produced by various species of Fusarium, Myrothecium, Trichoderma, Trichothecium, Cephalosporium, Verticimonosporium, and Stachybotrys. They are produced on many different grains like wheat, oats or maize by various Fusarium species. Some molds that produce trichothecene mycotoxins, such as Stachybotrys chartarum, can grow in damp indoor environments and may contribute to health problems among building occupants.[6]

Verrucarin A
Verrucarin A is macrocyclic trichothecenes are produced largely by Myrothecium, Stachybotrys and Fusarium. This toxin has a wide range of antiviral, antifungal and antibacterial activity. Trichothecenes are generally produced on many different grains like wheat, oats or maize. In early days, these macrocyclic trichothecene compounds structures were modified to create new anticancer agents.[7]

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Nivalenol (NIV)
Produced by the mold genus Fusarium, the type B trichothecenes, nivalenol (NIV) and their acetylated precursors are often contaminating cereal staples, posing a potential threat to public health that is still incompletely understood. Trichothecenes are very resistant to milling and processing, they can enter human food products easily. NIV is not found in food as commonly as DON; however, it demonstrates higher toxicity in animal studies. The toxicity of NIV is often compared to the toxicity of DON; however, the amount of toxicological data on NIV impact is much lower compared to DON.[19]

diacetoxyscirpenol (DAS)
Diacetoxyscirpenol (DAS), also known as anguidine, is a type A trichothecene mycotoxin primarily produced by Fusarium fungi. Trichothecenes are known as major contaminants of cereals and cereal-containing foods. DAS has been detected in agricultural products worldwide and persists in products after processing. In human as well as in animals, DAS consumption has been shown to induce haematological disorders (neutropenia, aplastic anemia). In the published literature, DAS has mainly been reported in various cereal grains (principally wheat, sorghum, maize, barley and oats) and cereal products, but also in potato products, soybeans and coffee. The highest levels have been reported for wheat, sorghum and coffee. DAS has been found to co-occur with many other mycotoxins in grains and grain-based products, in particular Fusarium toxins including type A and B trichothecenes, and zearalenone.[20]

T-2 toxin
T-2 Toxin is a tricothecene produced by species of Fusarium and is one of the rare and deadlier toxins. If ingested in sufficient quantity, T-2 toxin can severely damage the entire digestive tract and cause rapid death due to internal hemorrhage. T-2 has been implicated in the human diseases alimentary toxic aleukia and pulmonary hemosiderosis. Damage caused by T-2 toxin is often permanent.

Satratoxin G
Satratoxin G is a macrocyclic trichothecene mycotoxin produced by commonly called black mold or Stachybotrys chartarum, that contribute to disorders associated with water-damaged buildings. They are potent inhibitors of protein translation that initiate both inflammatory gene expression and apoptosis in vitro after upstream activation of mitogen-activated protein kinases (MAPKs). These water-soluble mycotoxins could produce airborne particles which could facilitate entry and release into respiratory airway tissue that may selectively induce apoptosis in olfactory sensory neurons in the nose (rhinitis) and brain(mild focal encephalitis).[21]

Satratoxin H
Satratoxin H is a trichothecene mycotoxin that have been recognized as one of the potential etiologic agents in outbreaks of sick building syndromes. satratoxin H, potently inhibit protein synthesis and thymocyte proliferation and also can cause diseases such as an immune dysfunction and idiopathic pulmonary hemorrhage in infants. Recent studies have shown a possible relationship between trichothecenes and disorders of central nervous system including severe neuronal death.[22]

Isosatratoxin F
Isosatratoxin F is another trichothecene produced by Stachybotrys chartarum. Several animal studies have shown that isosatratoxin F can cause nasal and pulmonary toxicity when administered intranasally or intratracheally. They showed that pulmonary alveolus cells were injured following intratracheal instillation of isosatratoxin F with marked changes in surfactant synthesis and secretion.[23]

Roridin H
Roridin H is produced mainly by Stachybotrys and categorized as a trichothecene mycotoxin. There are reports showing the involvement of these trichothecene in the development of 'sick building syndrome'. These trichothecenes were found in air samples in the ventilation systems of private houses and office buildings, and on the walls of houses with high humidity. The symptoms of airborne toxicosis disappeared when the buildings and ventilation systems were thoroughly cleaned.[25]

Roridin L-2
Roridin L2 is the putative biosynthetic precursor of Satratoxin G. It is a common trichothecene produced by S. chartarum isolates from water-damaged homes. Due to sturctural differences, roridin L2 possesses little in vitro or in vivo toxic activity as compared to SG.[26]

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Urinary Creatinine

Test Name (mg/ml)	Species Name	In Control	Moderate	High	Current Level	Previous Level (08/26/2020)
Urine Creatinine		0.25~2.16		≤0.24 ≥2.17	5.20	5.85

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Key Terms/Glossary

Mycotoxin	A toxic substance produced by a fungus
Antibacterial Compound	A compound active against bacteria to kill or remove them from the body
Antihelmintic Compound	A group of antiparasitic drugs that expel parasitic worms (helminths) and other internal parasites from the body by either stunning or killing them and without causing significant damage to the host.
Antifungal	A pharmaceutical fungicide or fungistatic used to treat and prevent mycosis.
Detoxification	Physiological or medicinal process of removal of toxic substances from a living organism, including the human body
Sick building syndrome	Medical condition where people in a building suffer from symptoms of illness or feel unwell for no apparent reason
Hepatocarcinoma	The most common primary liver tumor
Antischistosomal	An agent capable of affecting the viability of schistosomes
Sequestering agent	Nonabsorbable material capable of binding toxins in the gastrointestinal tract and reducing enterohepatic recirculation and ultimately the body burden of toxins.

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Citations/Sources

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Citations/Sources

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Risk and Limitations

This test has been developed and its performance characteristics determined by Vibrant America LLC., a CLIA and CAP certified lab. These assays have not been cleared or approved by the U.S. Food and Drug Administration.

Mycotoxins do not demonstrate absolute positive and negative predictive values for mold related illnesses. Clinical history must be incorporated into the diagnostic determination. Quantification of mycotoxins in urine is not FDA-recognized diagnostic indicator of mold exposure.

Mycotoxins testing is performed at Vibrant America, a CLIA certified laboratory and utilizes ISO-13485 developed technology. Vibrant America has effective procedures in place to protect against technical and operational problems. However, such problems may still occur. Examples include failure to obtain the result for a specific mycotoxin due to circumstances beyond Vibrant's control. Vibrant may re-test a sample in order to obtain these results but upon re-testing the results may still not be obtained. As with all medical laboratory testing, there is a small chance that the laboratory could report incorrect results. A tested individual may wish to pursue further testing to verify any results.

The information in this report is intended for educational purposes only. While every attempt has been made to provide current and accurate information, neither the author nor the publisher can be held accountable for any errors or omissions.

Vibrant Wellness makes no claims as to the diagnostic or therapeutic use of its tests or other informational materials. Vibrant Wellness reports and other information do not constitute medical advice and are not a substitute for professional medical advice. Please consult your healthcare practitioner for questions regarding test results, or before beginning any course of medication, supplementation or dietary changes.