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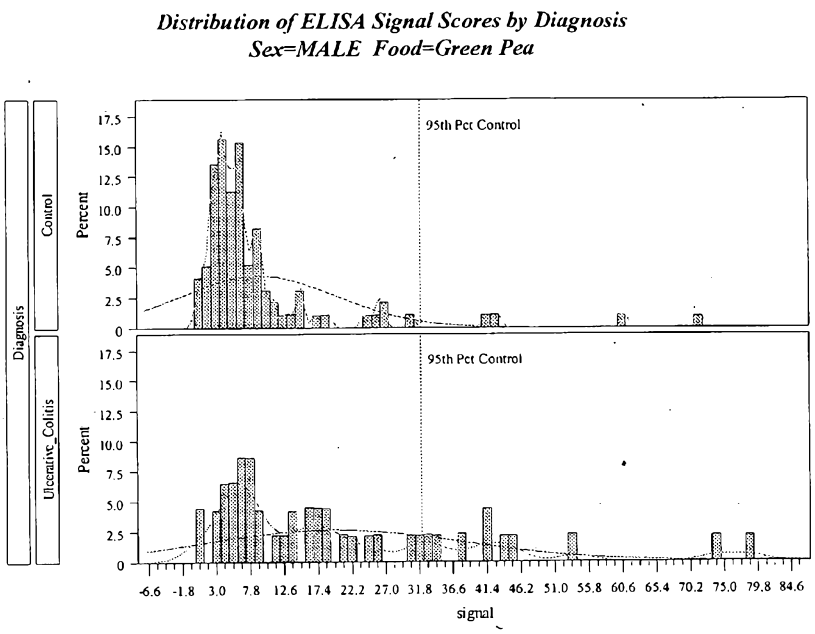

Figure 1A

(57) **Abstract:** Contemplated test kits and methods for food sensitivity are based on rational-based selection of food preparations with established discriminatory p-value. Particularly preferred kits include those with a minimum number of food preparations that have an average discriminatory p-value of ≤ 0.07 as determined by their raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value. In further contemplated aspects, compositions and methods for food sensitivity are also stratified by gender to further enhance predictive value.

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COMPOSITIONS, DEVICES, AND METHODS OF ULCERATIVE COLITIS SENSITIVITY TESTING

Related Applications

[0001] This application claims priority to our U.S. provisional patent application with the serial number, 62/327,932 filed April 26, 2016, which is incorporated by reference herein in its entirety.

Field of the Invention

[0002] The field of the invention is sensitivity testing for food intolerance, and especially as it relates to testing and possible elimination of selected food items as trigger foods for patients diagnosed with or suspected to have Ulcerative Colitis.

Background

[0003] The background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[0004] Food sensitivity, especially as it relates to Ulcerative Colitis (a type of inflammatory bowel disease), often presents with diarrhea mixed with blood and mucus and underlying causes of Ulcerative Colitis are not well understood in the medical community. Most typically, Ulcerative Colitis is diagnosed by endoscopic and radiological tests, along with blood tests or electrolyte tests to identify inflammatory conditions. Unfortunately, treatment of Ulcerative Colitis is often less than effective and may present new difficulties due to immune suppressive or modulatory effects. Elimination of other one or more food items has also shown promise in at least reducing incidence and/or severity of the symptoms. However, Ulcerative Colitis is often quite diverse with respect to dietary items triggering symptoms, and no standardized test to help identify trigger food items with a reasonable degree of certainty is known, leaving such patients often to trial-and-error.

[0005] While there are some commercially available tests and labs to help identify trigger foods, the quality of the test results from these labs is generally poor as is reported by a consumer advocacy group (*e.g.*, http://www.which.co.uk/news/2008/08/food-allergy-tests-

could-risk-your-health-154711/). Most notably, problems associated with these tests and labs were high false positive rates, high false negative rates, high intra-patient variability, and inter-laboratory variability, rendering such tests nearly useless. Similarly, further inconclusive and highly variable test results were also reported elsewhere (Alternative Medicine Review, Vol. 9, No. 2, 2004: pp 198-207), and the authors concluded that this may be due to food reactions and food sensitivities occurring via a number of different mechanisms. For example, not all Ulcerative Colitis patients show positive response to food A, and not all Ulcerative Colitis patients show negative response to food B. Thus, even if an Ulcerative Colitis patient shows positive response to food A, removal of food A from the patient's diet may not relieve the patient's Ulcerative Colitis symptoms. In other words, it is not well determined whether food samples used in the currently available tests are properly selected based on the high probabilities to correlate sensitivities to those food samples to Ulcerative Colitis.

[0006] All publications identified herein are incorporated by reference to the same extent as if each individual publication or patent application were specifically and individually indicated to be incorporated by reference. Where a definition or use of a term in an incorporated reference is inconsistent or contrary to the definition of that term provided herein, the definition of that term provided herein applies and the definition of that term in the reference does not apply.

[0007] Thus, even though various tests for food sensitivities are known in the art, all or almost all of them suffer from one or more disadvantages. Therefore, there is still a need for improved compositions, devices, and methods of food sensitivity testing, especially for identification and possible elimination of trigger foods for patients identified with or suspected of having Ulcerative Colitis.

Summary

[0008] The subject matter described herein provides systems and methods for testing food intolerance in patients diagnosed with or suspected to have Ulcerative Colitis. One aspect of the disclosure is a test kit with for testing food intolerance in patients diagnosed with or suspected to have Ulcerative Colitis. The test kit includes a plurality of distinct food preparations coupled to individually addressable respective solid carriers. The plurality of distinct food preparations have an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR

multiplicity adjusted p-value. In some embodiments, the average discriminatory p-value is determined by a process, which includes comparing assay values of a first patient test cohort that is diagnosed with or suspected of having Ulcerative Colitis with assay values of a second patient test cohort that is not diagnosed with or suspected of having Ulcerative Colitis.

[0009] Another aspect of the embodiments described herein includes a method of testing food intolerance in patients diagnosed with or suspected to have Ulcerative Colitis. The method includes a step of contacting a food preparation with a bodily fluid of a patient that is diagnosed with or suspected to have Ulcerative Colitis. The bodily fluid is associated with gender identification. In certain embodiments, the step of contacting is performed under conditions that allow IgG from the bodily fluid to bind to at least one component of the food preparation. The method continues with a step of measuring IgG bound to the at least one component of the food preparation to obtain a signal, and then comparing the signal to a gender-stratified reference value for the food preparation using the gender identification to obtain a result. Then, the method also includes a step of updating or generating a report using the result.

[0010] Another aspect of the embodiments described herein includes a method of generating a test for food intolerance in patients diagnosed with or suspected to have Ulcerative Colitis. The method includes a step of obtaining test results for a plurality of distinct food preparations. The test results are based on bodily fluids of patients diagnosed with or suspected to have Ulcerative Colitis and bodily fluids of a control group not diagnosed with or not suspected to have Ulcerative Colitis. The method also includes a step of stratifying the test results by gender for each of the distinct food preparations. Then the method continues with a step of assigning for a predetermined percentile rank a different cutoff value for male and female patients for each of the distinct food preparations.

[0011] Still another aspect of the embodiments described herein includes a use of a plurality of distinct food preparations coupled to individually addressable respective solid carriers in a diagnosis of Ulcerative Colitis. The plurality of distinct food preparations are selected based on their average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

[0012] Various objects, features, aspects and advantages of the embodiments described herein will become more apparent from the following detailed description of preferred

embodiments, along with the accompanying drawing figures in which like numerals represent like components.

Brief Description of The Drawings

[0013] Table 1 shows a list of food items from which food preparations can be prepared.

[0014] Table 2 shows statistical data of foods ranked according to 2-tailed FDR multiplicity-adjusted p-values.

[0015] Table 3 shows statistical data of ELISA score by food and gender.

[0016] Table 4 shows cutoff values of foods for a predetermined percentile rank.

[0017] Figure 1A illustrates ELISA signal score of male Ulcerative Colitis patients and control tested with green pea.

[0018] Figure 1B illustrates a distribution of percentage of male Ulcerative Colitis subjects exceeding the 90^{th} and 95^{th} percentile tested with green pea.

[0019] Figure 1C illustrates a signal distribution in women along with the 95^{th} percentile cutoff as determined from the female control population tested with green pea.

[0020] Figure 1D illustrates a distribution of percentage of female Ulcerative Colitis subjects exceeding the 90^{th} and 95^{th} percentile tested with green pea.

[0021] Figure 2A illustrates ELISA signal score of male Ulcerative Colitis patients and control tested with cantaloupe.

[0022] Figure 2B illustrates a distribution of percentage of male Ulcerative Colitis subjects exceeding the 90^{th} and 95^{th} percentile tested with cantaloupe.

[0023] Figure 2C illustrates a signal distribution in women along with the 95^{th} percentile cutoff as determined from the female control population tested with cantaloupe.

[0024] Figure 2D illustrates a distribution of percentage of female Ulcerative Colitis subjects exceeding the 90^{th} and 95^{th} percentile tested with cantaloupe.

[0025] Figure 3A illustrates ELISA signal score of male Ulcerative Colitis patients and control tested with pinto bean.

[0026] Figure 3B illustrates a distribution of percentage of male Ulcerative Colitis subjects exceeding the 90th and 95th percentile tested with pinto bean.

[0027] Figure 3C illustrates a signal distribution in women along with the 95th percentile cutoff as determined from the female control population tested with pinto bean.

[0028] Figure 3D illustrates a distribution of percentage of female Ulcerative Colitis subjects exceeding the 90th and 95th percentile tested with pinto bean.

[0029] Figure 4A illustrates ELISA signal score of male Ulcerative Colitis patients and control tested with cucumber.

[0030] Figure 4B illustrates a distribution of percentage of male Ulcerative Colitis subjects exceeding the 90th and 95th percentile tested with cucumber.

[0031] Figure 4C illustrates a signal distribution in women along with the 95th percentile cutoff as determined from the female control population tested with cucumber.

[0032] Figure 4D illustrates a distribution of percentage of female Ulcerative Colitis subjects exceeding the 90th and 95th percentile tested with cucumber.

[0033] Figure 5A illustrates distributions of Ulcerative Colitis subjects by number of foods that were identified as trigger foods at the 90th percentile.

[0034] Figure 5B illustrates distributions of Ulcerative Colitis subjects by number of foods that were identified as trigger foods at the 95th percentile.

[0035] Table 5A shows raw data of Ulcerative Colitis patients and control with number of positive results based on the 90th percentile.

[0036] Table 5B shows raw data of Ulcerative Colitis patients and control with number of positive results based on the 95th percentile.

[0037] Table 6A shows statistical data summarizing the raw data of Ulcerative Colitis patient populations shown in Table 5A.

[0038] Table 6B shows statistical data summarizing the raw data of Ulcerative Colitis patient populations shown in Table 5B.

[0039] Table 7A shows statistical data summarizing the raw data of control populations shown in Table 5A.

[0040] Table 7B shows statistical data summarizing the raw data of control populations shown in Table 5B.

[0041] Table 8A shows statistical data summarizing the raw data of Ulcerative Colitis patient populations shown in Table 5A transformed by logarithmic transformation.

[0042] Table 8B shows statistical data summarizing the raw data of Ulcerative Colitis patient populations shown in Table 5B transformed by logarithmic transformation.

[0043] Table 9A shows statistical data summarizing the raw data of control populations shown in Table 5A transformed by logarithmic transformation.

[0044] Table 9B shows statistical data summarizing the raw data of control populations shown in Table 5B transformed by logarithmic transformation.

[0045] Table 10A shows statistical data of an independent T-test to compare the geometric mean number of positive foods between the Ulcerative Colitis and non-Ulcerative Colitis samples based on the 90^{th} percentile.

[0046] Table 10B shows statistical data of an independent T-test to compare the geometric mean number of positive foods between the Ulcerative Colitis and non-Ulcerative Colitis samples based on the 95^{th} percentile.

[0047] Table 11A shows statistical data of a Mann-Whitney test to compare the geometric mean number of positive foods between the Ulcerative Colitis and non-Ulcerative Colitis samples based on the 90^{th} percentile.

[0048] Table 11B shows statistical data of a Mann-Whitney test to compare the geometric mean number of positive foods between the Ulcerative Colitis and non-Ulcerative Colitis samples based on the 95^{th} percentile.

[0049] Figure 6A illustrates a box and whisker plot of data shown in Table 5A.

[0050] Figure 6B illustrates a notched box and whisker plot of data shown in Table 5A.

[0051] Figure 6C illustrates a box and whisker plot of data shown in Table 5B.

[0052] Figure 6D illustrates a notched box and whisker plot of data shown in Table 5B.

[0053] Table 12A shows statistical data of a Receiver Operating Characteristic (ROC) curve analysis of data shown in Tables 5A-11A.

[0054] Table 12B shows statistical data of a Receiver Operating Characteristic (ROC) curve analysis of data shown in Tables 5B-11B.

[0055] Figure 7A illustrates the ROC curve corresponding to the statistical data shown in Table 12A.

[0056] Figure 7B illustrates the ROC curve corresponding to the statistical data shown in Table 12B.

[0057] Table 13A shows a statistical data of performance metrics in predicting Ulcerative Colitis status among female patients from number of positive foods based on the 90^{th} percentile.

[0058] Table 13B shows a statistical data of performance metrics in predicting Ulcerative Colitis status among male patients from number of positive foods based on the 90^{th} percentile.

[0059] Table 14A shows a statistical data of performance metrics in predicting Ulcerative Colitis status among female patients from number of positive foods based on the 95^{th} percentile.

[0060] Table 14B shows a statistical data of performance metrics in predicting Ulcerative Colitis status among male patients from number of positive foods based on the 95^{th} percentile.

Detailed Description

[0061] The inventors have discovered that food preparations used in food tests to identify trigger foods in patients diagnosed with or suspected to have Ulcerative Colitis are not equally well predictive and/or associated with Ulcerative Colitis/Ulcerative Colitis

symptoms. Indeed, various experiments have revealed that among a wide variety of food items certain food items are highly predictive/associated with Ulcerative Colitis whereas others have no statistically significant association with Ulcerative Colitis.

[0062] Even more unexpectedly, the inventors discovered that in addition to the high variability of food items, gender variability with respect to response in a test plays a substantial role in the determination of association or a food item with Ulcerative Colitis. Consequently, based on the inventors' findings and further contemplations, test kits and methods are now presented with substantially higher predictive power in the choice of food items that could be eliminated for reduction of Ulcerative Colitis signs and symptoms.

[0063] The following discussion provides many example embodiments of the inventive subject matter. Although each embodiment represents a single combination of inventive elements, the inventive subject matter is considered to include all possible combinations of the disclosed elements. Thus if one embodiment comprises elements A, B, and C, and a second embodiment comprises elements B and D, then the inventive subject matter is also considered to include other remaining combinations of A, B, C, or D, even if not explicitly disclosed.

[0064] In some embodiments, the numbers expressing quantities or ranges, used to describe and claim certain embodiments of the invention are to be understood as being modified in some instances by the term "about." Accordingly, in some embodiments, the numerical parameters set forth in the written description and attached claims are approximations that can vary depending upon the desired properties sought to be obtained by a particular embodiment. In some embodiments, the numerical parameters should be construed in light of the number of reported significant digits and by applying ordinary rounding techniques. Notwithstanding that the numerical ranges and parameters setting forth the broad scope of some embodiments of the invention are approximations, the numerical values set forth in the specific examples are reported as precisely as practicable. The numerical values presented in some embodiments of the invention may contain certain errors necessarily resulting from the standard deviation found in their respective testing measurements. Unless the context dictates the contrary, all ranges set forth herein should be interpreted as being inclusive of their endpoints and open-ended ranges should be interpreted to include only commercially practical values. Similarly, all lists of values should be considered as inclusive of intermediate values unless the context indicates the contrary.

[0065] As used in the description herein and throughout the claims that follow, the meaning of "a," "an," and "the" includes plural reference unless the context clearly dictates otherwise. Also, as used in the description herein, the meaning of "in" includes "in" and "on" unless the context clearly dictates otherwise.

[0066] All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (*e.g.*, "such as") provided with respect to certain embodiments herein is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention otherwise claimed. No language in the specification should be construed as indicating any non-claimed element essential to the practice of the invention.

[0067] Groupings of alternative elements or embodiments of the invention disclosed herein are not to be construed as limitations. Each group member can be referred to and claimed individually or in any combination with other members of the group or other elements found herein. One or more members of a group can be included in, or deleted from, a group for reasons of convenience and/or patentability. When any such inclusion or deletion occurs, the specification is herein deemed to contain the group as modified thus fulfilling the written description of all Markush groups used in the appended claims.

[0068] In one aspect, the inventors therefore contemplate a test kit or test panel that is suitable for testing food intolerance in patients where the patient is diagnosed with or suspected to have Ulcerative Colitis. Most preferably, such test kit or panel will include a plurality of distinct food preparations (*e.g.*, raw or processed extract, preferably aqueous extract with optional co-solvent, which may or may not be filtered) that are coupled to individually addressable respective solid carriers (*e.g.*, in a form of an array or a micro well plate), wherein the distinct food preparations have an average discriminatory p-value of $\leq$ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

[0069] In some embodiments, the numbers expressing quantities of ingredients, properties such as concentration, reaction conditions, and so forth, used to describe and claim certain embodiments of the invention are to be understood as being modified in some instances by the term "about." Accordingly, in some embodiments, the numerical parameters set forth in

the written description and attached claims are approximations that can vary depending upon the desired properties sought to be obtained by a particular embodiment. In some embodiments, the numerical parameters should be construed in light of the number of reported significant digits and by applying ordinary rounding techniques. Notwithstanding that the numerical ranges and parameters setting forth the broad scope of some embodiments of the invention are approximations, the numerical values set forth in the specific examples are reported as precisely as practicable. The numerical values presented in some embodiments of the invention may contain certain errors necessarily resulting from the standard deviation found in their respective testing measurements. Moreover, and unless the context dictates the contrary, all ranges set forth herein should be interpreted as being inclusive of their endpoints and open-ended ranges should be interpreted to include only commercially practical values. Similarly, all lists of values should be considered as inclusive of intermediate values unless the context indicates the contrary.

[0070] While not limiting to the inventive subject matter, food preparations will typically be drawn from foods generally known or suspected to trigger signs or symptoms of Ulcerative Colitis. Particularly suitable food preparations may be identified by the experimental procedures outlined below. Thus, it should be appreciated that the food items need not be limited to the items described herein, but that all items are contemplated that can be identified by the methods presented herein. Therefore, exemplary food preparations include at least two, at least four, at least eight, or at least 12 food preparations prepared from foods 1-58 of **Table 2**. Still further especially contemplated food items and food additives from which food preparations can be prepared are listed in **Table 1**.

[0071] Using bodily fluids from patients diagnosed with or suspected to have Ulcerative Colitis and healthy control group individuals (*i.e.*, those not diagnosed with or not suspected to have Ulcerative Colitis), numerous additional food items may be identified. Preferably, such identified food items will have high discriminatory power and as such have a p-value of ≤ 0.15, more preferably ≤ 0.10, and most preferably ≤ 0.05 as determined by raw p-value, and/or a p-value of ≤ 0.10, more preferably ≤ 0.08, and most preferably ≤ 0.07 as determined by False Discovery Rate (FDR) multiplicity adjusted p-value.

[0072] In certain embodiments, such identified food preparations will have high discriminatory power and, as such, will have a p-value of ≤ 0.15, ≤ 0.10, or even ≤ 0.05 as

determined by raw p-value, and/or a p-value of ≤ 0.10, ≤ 0.08, or even ≤ 0.07 as determined by False Discovery Rate (FDR) multiplicity adjusted p-value.

[0073] Therefore, where a panel has multiple food preparations, it is contemplated that the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value, or even more preferably an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value. In further preferred aspects, it should be appreciated that the FDR multiplicity adjusted p-value may be adjusted for at least one of age and gender, and most preferably adjusted for both age and gender. On the other hand, where a test kit or panel is stratified for use with a single gender, it is also contemplated that in a test kit or panel at least 50% (and more typically 70% or all) of the plurality of distinct food preparations, when adjusted for a single gender, have an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value. Furthermore, it should be appreciated that other stratifications (*e.g.*, dietary preference, ethnicity, place of residence, genetic predisposition or family history, etc.) are also contemplated, and the person of ordinary skill in the art (PHOSITA) will be readily appraised of the appropriate choice of stratification.

[0074] The recitation of ranges of values herein is merely intended to serve as a shorthand method of referring individually to each separate value falling within the range. Unless otherwise indicated herein, each individual value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (*e.g.*, "such as") provided with respect to certain embodiments herein is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention otherwise claimed. No language in the specification should be construed as indicating any non-claimed element essential to the practice of the invention.

[0075] Of course, it should be noted that the particular format of the test kit or panel may vary considerably and contemplated formats include micro well plates, dip sticks, membrane-bound arrays, etc. Consequently, the solid carrier to which the food preparations are coupled may include wells of a multiwell plate, a bead (*e.g.*, color-coded or magnetic), or an

adsorptive film (*e.g.*, nitrocellulose or micro/nanoporous polymeric film), or an electrical sensor (*e.g.*, a printed copper sensor or microchip).

[0076] Consequently, the inventors also contemplate a method of testing food intolerance in patients that are diagnosed with or suspected to have Ulcerative Colitis. Most typically, such methods will include a step of contacting a food preparation with a bodily fluid (*e.g.*, whole blood, plasma, serum, saliva, or a fecal suspension) of a patient that is diagnosed with or suspected to have Ulcerative Colitis, and wherein the bodily fluid is associated with a gender identification. As noted before, the step of contacting is preferably performed under conditions that allow IgG (or IgE or IgA or IgM) from the bodily fluid to bind to at least one component of the food preparation, and the IgG bound to the component(s) of the food preparation are then quantified/measured to obtain a signal. In some embodiments, the signal is then compared against a gender-stratified reference value (*e.g.*, at least a 90th percentile value) for the food preparation using the gender identification to obtain a result, which is then used to update or generate a report (*e.g.*, written medical report; oral report of results from doctor to patient; written or oral directive from physician based on results).

[0077] In certain embodiments, such methods will not be limited to a single food preparation, but will employ multiple different food preparations. As noted before, suitable food preparations can be identified using various methods as described below, however, especially preferred food preparations include foods 1-58 of Table 2, and/or items of **Table 1**. As also noted above, it is generally preferred that at least some, or all of the different food preparations have an average discriminatory p-value of ≤ 0.07 (or ≤ 0.05, or ≤ 0.025) as determined by raw p-value, and/or or an average discriminatory p-value of ≤ 0.10 (or ≤ 0.08, or ≤ 0.07) as determined by FDR multiplicity adjusted p-value.

[0078] While in certain embodiments food preparations are prepared from single food items as crude extracts, or crude filtered extracts, it is contemplated that food preparations can be prepared from mixtures of a plurality of food items (*e.g.*, a mixture of citrus comprising lemon, orange, and a grapefruit, a mixture of yeast comprising baker's yeast and brewer's yeast, a mixture of rice comprising a brown rice and white rice, a mixture of sugars comprising honey, malt, and cane sugar. In some embodiments, it is also contemplated that food preparations can be prepared from purified food antigens or recombinant food antigens.

[0079] As it is generally preferred that the food preparation is immobilized on a solid surface (typically in an addressable manner), it is contemplated that the step of measuring the IgG or other type of antibody bound to the component of the food preparation is performed via an ELISA test. Exemplary solid surfaces include, but are not limited to, wells in a multiwell plate, such that each food preparation may be isolated to a separate microwell. In certain embodiments, the food preparation will be coupled to, or immobilized on, the solid surface. In other embodiments, the food preparation(s) will be coupled to a molecular tag that allows for binding to human immunoglobulins (*e.g.,* IgG) in solution.

[0080] Viewed from a different perspective, the inventors also contemplate a method of generating a test for food intolerance in patients diagnosed with or suspected to have Ulcerative Colitis. Because the test is applied to patients already diagnosed with or suspected to have Ulcerative Colitis, the authors do not contemplate that the method has a diagnostic purpose. Instead, the method is for identifying triggering food items among already diagnosed or suspected Ulcerative Colitis patients. Such test will typically include a step of obtaining one or more test results (*e.g.,* ELISA) for various distinct food preparations, wherein the test results are based on bodily fluids (*e.g.,* blood saliva, fecal suspension) of patients diagnosed with or suspected to have Ulcerative Colitis and bodily fluids of a control group not diagnosed with or not suspected to have Ulcerative Colitis. Most preferably, the test results are then stratified by gender for each of the distinct food preparations, a different cutoff value for male and female patients for each of the distinct food preparations (*e.g.,* cutoff value for male and female patients has a difference of at least 10% (abs)) is assigned for a predetermined percentile rank (*e.g.,* 90th or 95th percentile).

[0081] As noted earlier, and while not limiting to the inventive subject matter, it is contemplated that the distinct food preparations include at least two (or six, or ten, or 15) food preparations prepared from food items selected from the group consisting of foods 1-58 of **Table 2**, and/or items of **Table 1**. On the other hand, where new food items are tested, it should be appreciated that the distinct food preparations include a food preparation prepared from a food items other than foods 1-58 of **Table 2**. Regardless of the particular choice of food items, it is generally preferred however, that the distinct food preparations have an average discriminatory p-value of ≤ 0.07 (or ≤ 0.05, or ≤ 0.025) as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 (or ≤ 0.08, or ≤ 0.07) as determined by FDR

multiplicity adjusted p-value. Exemplary aspects and protocols, and considerations are provided in the experimental description below.

[0082] Thus, it should be appreciated that by having a high-confidence test system as described herein, the rate of false-positive and false negatives can be significantly reduced, and especially where the test systems and methods are gender stratified or adjusted for gender differences as shown below. Such advantages have heretofore not been realized and it is expected that the systems and methods presented herein will substantially increase the predictive power of food sensitivity tests for patients diagnosed with or suspected to have Ulcerative Colitis.

Experiments

[0083] General Protocol for food preparation generation: Commercially available food extracts (available from Biomerica Inc., 17571 Von Karman Ave, Irvine, CA 92614) prepared from the edible portion of the respective raw foods were used to prepare ELISA plates following the manufacturer's instructions.

[0084] For some food extracts, the inventors expect that food extracts prepared with specific procedures to generate food extracts provides more superior results in detecting elevated IgG reactivity in Ulcerative Colitis patients compared to commercially available food extracts. For example, for grains and nuts, a three-step procedure of generating food extracts is preferred. The first step is a defatting step. In this step, lipids from grains and nuts are extracted by contacting the flour of grains and nuts with a non-polar solvent and collecting residue. Then, the defatted grain or nut flour are extracted by contacting the flour with elevated pH to obtain a mixture and removing the solid from the mixture to obtain the liquid extract. Once the liquid extract is generated, the liquid extract is stabilized by adding an aqueous formulation. In a preferred embodiment, the aqueous formulation includes a sugar alcohol, a metal chelating agent, protease inhibitor, mineral salt, and buffer component 20-50 mM of buffer from 4-9 pH. This formulation allowed for long term storage at -70 °C and multiple freeze-thaws without a loss of activity.

[0085] For another example, for meats and fish, a two step procedure of generating food extract is preferred. The first step is an extraction step. In this step, extracts from raw, uncooked meats or fish are generated by emulsifying the raw, uncooked meats or fish in an aqueous buffer formulation in a high impact pressure processor. Then, solid materials are

removed to obtain liquid extract. Once the liquid extract is generated, the liquid extract is stabilized by adding an aqueous formulation. In a preferred embodiment, the aqueous formulation includes a sugar alcohol, a metal chelating agent, protease inhibitor, mineral salt, and buffer component 20-50 mM of buffer from 4-9 pH. This formulation allowed for long term storage at -70 °C and multiple freeze-thaws without a loss of activity.

[0086] For still another example, for fruits and vegetables, a two step procedure of generating food extract is preferred. The first step is an extraction step. In this step, liquid extracts from fruits or vegetables are generated using an extractor (*e.g.,* masticating juicer, etc) to pulverize foods and extract juice. Then, solid materials are removed to obtain liquid extract. Once the liquid extract is generated, the liquid extract is stabilized by adding an aqueous formulation. In a preferred embodiment, the aqueous formulation includes a sugar alcohol, a metal chelating agent, protease inhibitor, mineral salt, and buffer component 20-50 mM of buffer from 4-9 pH. This formulation allowed for long term storage at -70 °C and multiple freeze-thaws without a loss of activity.

[0087] Blocking of ELISA plates: To optimize signal to noise, plates will be blocked with a proprietary blocking buffer. In a preferred embodiment, the blocking buffer includes 20-50 mM of buffer from 4-9 pH, a protein of animal origin and a short chain alcohol. Other blocking buffers, including several commercial preparations, can be attempted but may not provide adequate signal to noise and low assay variability required.

[0088] ELISA preparation and sample testing: Food antigen preparations were immobilized onto respective microtiter wells following the manufacturer's instructions. For the assays, the food antigens were allowed to react with antibodies present in the patients' serum, and excess serum proteins were removed by a wash step. For detection of IgG antibody binding, enzyme labeled anti-IgG antibody conjugate was allowed to react with antigen-antibody complex. A color was developed by the addition of a substrate that reacts with the coupled enzyme. The color intensity was measured and is directly proportional to the concentration of IgG antibody specific to a particular food antigen.

[0089] Methodology to determine ranked food list in order of ability of ELISA signals to distinguish Ulcerative Colitis from control subjects: Out of an initial selection (*e.g.,* 100 food items, or 150 food items, or even more), samples can be eliminated prior to analysis due to low consumption in an intended population. In addition, specific food items can be used as

being representative of a larger generic food group, especially where prior testing has established a correlation among different species within a generic group (most preferably in both genders, but also suitable for correlation for a single gender). For example, green pepper could be dropped in favor of chili pepper as representative of the "pepper" food group, or sweet potato could be dropped in favor of potato as representative of the "potato" food group. In further preferred aspects, the final list foods will be shorter than 50 food items, and more preferably equal or less than of 40 food items.

[0090] Since the foods ultimately selected for the food intolerance panel will not be specific for a particular gender, a gender-neutral food list is necessary. Since the observed sample will be at least initially imbalanced by gender (*e.g.*, Controls: 40% female, Ulcerative Colitis: 55% female), differences in ELISA signal magnitude strictly due to gender will be removed by modeling signal scores against gender using a two-sample t-test and storing the residuals for further analysis. For each of the tested foods, residual signal scores will be compared between Ulcerative Colitis and controls using a permutation test on a two-sample t-test with a relative high number of resamplings (*e.g.*, >1,000, more preferably >10,000, even more preferably >50,000). The Satterthwaite approximation can then be used for the denominator degrees of freedom to account for lack of homogeneity of variances, and the 2-tailed permuted p-value will represent the raw p-value for each food. False Discovery Rates (FDR) among the comparisons, will be adjusted by any acceptable statistical procedures (*e.g.*, Benjamini-Hochberg, Family-wise Error Rate (FWER), Per Comparison Error Rate (PCER), etc.).

[0091] Foods were then ranked according to their 2-tailed FDR multiplicity-adjusted p-values. Foods with adjusted p-values equal to or lower than the desired FDR threshold are deemed to have significantly higher signal scores among Ulcerative Colitis than control subjects and therefore deemed candidates for inclusion into a food intolerance panel. A typical result that is representative of the outcome of the statistical procedure is provided in **Table 2**. Here the ranking of foods is according to 2-tailed permutation T-test p-values with FDR adjustment.

[0092] Based on earlier experiments (data not shown here, see US 62/327932), the inventors contemplate that even for the same food preparation tested, the ELISA score for at least several food items will vary dramatically, and exemplary raw data are provided in **Table 3**. As should be readily appreciated, data unstratified by gender will therefore lose significant

explanatory power where the same cutoff value is applied to raw data for male and female data. To overcome such disadvantage, the inventors therefore contemplate stratification of the data by gender as described below.

[0093] Statistical Method for Cutpoint Selection for each Food: The determination of what ELISA signal scores would constitute a "positive" response can be made by summarizing the distribution of signal scores among the Control subjects. For each food, Ulcerative Colitis subjects who have observed scores greater than or equal to selected quantiles of the Control subject distribution will be deemed "positive". To attenuate the influence of any one subject on cutpoint determination, each food-specific and gender-specific dataset will be bootstrap resampled 1000 times. Within each bootstrap replicate, the 90th and 95th percentiles of the Control signal scores will be determined. Each Ulcerative Colitis subject in the bootstrap sample will be compared to the 90th and 95% percentiles to determine whether he/she had a "positive" response. The final 90th and 95th percentile-based cutpoints for each food and gender will be computed as the average 90th and 95th percentiles across the 1000 samples. The number of foods for which each Ulcerative Colitis subject will be rated as "positive" was computed by pooling data across foods. Using such method, the inventors will be now able to identify cutoff values for a predetermined percentile rank that in most cases was substantially different as can be taken from **Table 4**.

[0094] Typical examples for the gender difference in IgG response in blood with respect to green pea is shown in **Figures 1A-1D,** where Figure 1A shows the signal distribution in men along with the 95^{th} percentile cutoff as determined from the male control population. Figure 1B shows the distribution of percentage of male Ulcerative Colitis subjects exceeding the 90^{th} and 95^{th} percentile, while Figure 1C shows the signal distribution in women along with the 95^{th} percentile cutoff as determined from the female control population. Figure 1D shows the distribution of percentage of female Ulcerative Colitis subjects exceeding the 90^{th} and 95^{th} percentile. In the same fashion, **Figures 2A-2D** exemplarily depict the differential response to cantaloupe, **Figures 3A-3D** exemplarily depict the differential response to pinto bean, and **Figures 4A-4D** exemplarily depict the differential response to cucumber. **Figures 5A-5B** show the distribution of Ulcerative Colitis subjects by number of foods that were identified as trigger foods at the 90^{th} percentile (5A) and 95^{th} percentile (5B). Inventors contemplate that regardless of the particular food items, male and female responses will be notably distinct.

[0095] It should be noted that nothing in the art have provided any predictable food groups related to Ulcerative Colitis that is gender-stratified. Thus, a discovery of food items that show distinct responses by gender is a surprising result, which could not be obviously expected in view of all previously available arts. In other words, selection of food items based on gender stratification provides an unexpected technical effect such that statistical significances for particular food items as triggering food among male or female Ulcerative Colitis patients have been significantly improved.

[0096] Normalization of IgG Response Data: While the raw data of the patient's IgG response results can be used to compare strength of response among given foods, it is also contemplated that the IgG response results of a patient are normalized and indexed to generate unit-less numbers for comparison of relative strength of response to a given food. For example, one or more of a patient's food specific IgG results (*e.g.*, IgG specific to orange and IgG specific to malt) can be normalized to the patient's total IgG. The normalized value of the patient's IgG specific to orange can be 0.1 and the normalized value of the patient's IgG specific to malt can be 0.3. In this scenario, the relative strength of the patient's response to malt is three times higher compared to orange. Then, the patient's sensitivity to malt and orange can be indexed as such.

[0097] In other examples, one or more of a patient's food specific IgG results (*e.g.*, IgG specific to shrimp and IgG specific to pork) can be normalized to the global mean of that patient's food specific IgG results. The global means of the patient's food specific IgG can be measured by total amount of the patient's food specific IgG. In this scenario, the patient's specific IgG to shrimp can be normalized to the mean of patient's total food specific IgG (*e.g.*, mean of IgG levels to shrimp, pork, Dungeness crab, chicken, peas, etc.). However, it is also contemplated that the global means of the patient's food specific IgG can be measured by the patient's IgG levels to a specific type of food via multiple tests. If the patient have been tested for his sensitivity to shrimp five times and to pork seven times previously, the patient's new IgG values to shrimp or to pork are normalized to the mean of five-times test results to shrimp or the mean of seven-times test results to pork. The normalized value of the patient's IgG specific to shrimp can be 6.0 and the normalized value of the patient's IgG specific to pork can be 1.0. In this scenario, the patient has six times higher sensitivity to shrimp at this time compared to his average sensitivity to shrimp, but substantially similar

sensitivity to pork. Then, the patient's sensitivity to shrimp and pork can be indexed based on such comparison.

[0098] Methodology to determine the subset of Ulcerative Colitis patients with food sensitivities that underlie Ulcerative Colitis: While it is suspected that food sensitivities plays a substantial role in signs and symptoms of Ulcerative Colitis, some Ulcerative Colitis patients may not have food sensitivities that underlie Ulcerative Colitis. Those patients would not be benefit from dietary intervention to treat signs and symptoms of Ulcerative Colitis. To determine the subset of such patients, body fluid samples of Ulcerative Colitis patients and non-Ulcerative Colitis patients can be tested with ELISA test using test devices with up to 58 food samples.

[0099] **Table 5A** and **Table 5B** provide exemplary raw data. As should be readily appreciated, the data indicate number of positive results out of 58 sample foods based on 90^{th} percentile value (**Table 5A**) or 95^{th} percentile value (**Table 5B**). The first column is Ulcerative Colitis (n=103); second column is non-Ulcerative Colitis (n=163) by ICD-10 code. Average and median number of positive foods was computed for Ulcerative Colitis and non-Ulcerative Colitis patients. From the raw data shown in **Table 5A** and **Table 5B**, average and standard deviation of the number of positive foods was computed for Ulcerative Colitis and non-Ulcerative Colitis patients. Additionally, the number and percentage of patients with zero positive foods was calculated for both Ulcerative Colitis and non-Ulcerative Colitis. The number and percentage of patients with zero positive foods in the Ulcerative Colitis population is more than 6-fold lower than the percentage of patients with zero positive foods in the non-Ulcerative Colitis population (3% vs. 19%, respectively) based on 90^{th} percentile value (**Table 5A**), and the percentage of patients in the Ulcerative Colitis population with zero positive foods is also less than half of that seen in the non-Ulcerative Colitis population (12 % vs. 31%, respectively) based on 95^{th} percentile value (**Table 5B**). Thus, it can be easily appreciated that the Ulcerative Colitis patient having sensitivity to zero positive foods is unlikely to have food sensitivities underlying their signs and symptoms of Ulcerative Colitis.

[00100] **Table 6A** and **Table 7A** show exemplary statistical data summarizing the raw data of two patient populations shown in Table 5A. The statistical data includes normality, arithmetic mean, median, percentiles and 95% confidence interval (CI) for the mean and median representing number of positive foods in the Ulcerative Colitis population and the non-Ulcerative Colitis population. **Table 6B** and **Table 7B** show exemplary statistical data

summarizing the raw data of two patient populations shown in Table 5B. The statistical data includes normality, arithmetic mean, median, percentiles and 95% confidence interval (CI) for the mean and median representing number of positive foods in the Ulcerative Colitis population and the non-Ulcerative Colitis population.

[00101] **Table 8A** and **Table 9A** show exemplary statistical data summarizing the raw data of two patient populations shown in Table 5A. In Tables 8A and 9A, the raw data was transformed by logarithmic transformation to improve the data interpretation. **Table 8B** and **Table 9B** show another exemplary statistical data summarizing the raw data of two patient populations shown in Table 5B. In Tables 8B and 9B, the raw data was transformed by logarithmic transformation to improve the data interpretation.

[00102] **Table 10A** and **Table 11A** show exemplary statistical data of an independent T-test (Table 10A, logarithmically transformed data) and a Mann-Whitney test (Table 11A) to compare the geometric mean number of positive foods between the Ulcerative Colitis and non-Ulcerative Colitis samples. The data shown in Table 10A and Table 11A indicate statistically significant differences in the geometric mean of positive number of foods between the Ulcerative Colitis population and the non-Ulcerative Colitis population. In both statistical tests, it is shown that the number of positive responses with 58 food samples is significantly higher in the Ulcerative Colitis population than in the non-Ulcerative Colitis population with an average discriminatory p-value of ≤ 0.0001. These statistical data is also illustrated as a box and whisker plot in **Figure 6A**, and a notched box and whisker plot in **Figure 6B**.

[00103] **Table 10B** and **Table 11B** show exemplary statistical data of an independent T-test (Table 10A, logarithmically transformed data) and a Mann-Whitney test (Table 11B) to compare the geometric mean number of positive foods between the Ulcerative Colitis and non-Ulcerative Colitis samples. The data shown in Table 10B and Table 11B indicate statistically significant differences in the geometric mean of positive number of foods between the Ulcerative Colitis population and the non-Ulcerative Colitis population. In both statistical tests, it is shown that the number of positive responses with 58 food samples is significantly higher in the Ulcerative Colitis population than in the non-Ulcerative Colitis population with an average discriminatory p-value of ≤ 0.0001. These statistical data is also illustrated as a box and whisker plot in **Figure 6C**, and a notched box and whisker plot in **Figure 6D**.

[00104] **Table 12A** shows exemplary statistical data of a Receiver Operating Characteristic (ROC) curve analysis of data shown in Tables 5A-11A to determine the diagnostic power of the test used in Table 5 at discriminating Ulcerative Colitis from non-Ulcerative Colitis subjects. When a cutoff criterion of more than 5 positive foods is used, the test yields a data with 66% sensitivity and 68% specificity, with an area under the curve (AUROC) of 0.720. The p-value for the ROC is significant at a p-value of <0.0001. **Figure 7A** illustrates the ROC curve corresponding to the statistical data shown in Table 12A. Because the statistical difference between the Ulcerative Colitis population and the non-Ulcerative Colitis population is significant when the test results are cut off to a positive number of 5, the number of foods for which a patient tests positive could be used as a confirmation of the primary clinical diagnosis of Ulcerative Colitis, and whether it is likely that food sensitivities underlies on the patient's signs and symptoms of Ulcerative Colitis. Therefore, the above test can be used as another 'rule in' test to add to currently available clinical criteria for diagnosis for Ulcerative Colitis.

[00105] As shown in Tables 5A-12A, and Figure 7A, based on 90^{th} percentile data, the number of positive foods seen in Ulcerative Colitis vs. non-Ulcerative Colitis subjects is significantly different whether the geometric mean or median of the data is compared. The number of positive foods that a person has is indicative of the presence of Ulcerative Colitis in subjects. The test has discriminatory power to detect Ulcerative Colitis with ~66% sensitivity and ~68% specificity. Additionally, the absolute number and percentage of subjects with 0 positive foods is also very different in Ulcerative Colitis vs. non-Ulcerative Colitis subjects, with a far lower percentage of Ulcerative Colitis subjects (3%) having 0 positive foods than non-Ulcerative Colitis subjects (19%). The data suggests a subset of Ulcerative Colitis patients may have Ulcerative Colitis due to other factors than diet, and may not benefit from dietary restriction.

[00106] **Table 12B** shows exemplary statistical data of a Receiver Operating Characteristic (ROC) curve analysis of data shown in Tables 5B-11B to determine the diagnostic power of the test used in Table 5 at discriminating Ulcerative Colitis from non-Ulcerative Colitis subjects. When a cutoff criterion of more than 3 positive foods is used, the test yields a data with 60.2% sensitivity and 75.5% specificity, with an area under the curve (AUROC) of 0.719. The p-value for the ROC is significant at a p-value of <0.0001. **Figure 7B** illustrates the ROC curve corresponding to the statistical data shown in Table 12B.

Because the statistical difference between the Ulcerative Colitis population and the non-Ulcerative Colitis population is significant when the test results are cut off to positive number of >3, the number of foods that a patient tests positive could be used as a confirmation of the primary clinical diagnosis of Ulcerative Colitis, and whether it is likely that food sensitivities underlies on the patient's signs and symptoms of Ulcerative Colitis. Therefore, the above test can be used as another 'rule in' test to add to currently available clinical criteria for diagnosis for Ulcerative Colitis.

[00107] As shown in Tables 5B-12B, and Figure 7B, based on 95th percentile data, the number of positive foods seen in Ulcerative Colitis vs. non-Ulcerative Colitis subjects is significantly different whether the geometric mean or median of the data is compared. The number of positive foods that a person has is indicative of the presence of Ulcerative Colitis in subjects. The test has discriminatory power to detect Ulcerative Colitis with ~60% sensitivity and ~76% specificity. Additionally, the absolute number and percentage of subjects with 0 positive foods is also very different in Ulcerative Colitis vs. non-Ulcerative Colitis subjects, with a far lower percentage of Ulcerative Colitis subjects (~19%) having 0 positive foods than non- Ulcerative Colitis subjects (~31%). The data suggests a subset of Ulcerative Colitis patients may have Ulcerative Colitis due to other factors than diet, and may not benefit from dietary restriction.

[00108] Method for determining distribution of per-person number of foods declared "positive": To determine the distribution of number of "positive" foods per person and measure the diagnostic performance, the analysis will be performed with 58 food items from Table 2, which shows most positive responses to Ulcerative Colitis patients. To attenuate the influence of any one subject on this analysis, each food-specific and gender-specific dataset will be bootstrap resampled 1000 times. Then, for each food item in the bootstrap sample, sex-specific cutpoint will be determined using the 90th and 95th percentiles of the control population. Once the sex-specific cutpoints are determined, the sex-specific cutpoints will be compared with the observed ELISA signal scores for both control and Ulcerative Colitis subjects. In this comparison, if the observed signal is equal or more than the cutpoint value, then it will be determined "positive" food, and if the observed signal is less than the cutpoint value, then it will be determined "negative" food.

[00109] Once all food items were determined either positive or negative, the results of the 116 (58 foods x 2 cutpoints) calls for each subject will be saved within each bootstrap

replicate. Then, for each subject, 58 calls will be summed using 90th percentile as cutpoint to get "Number of Positive Foods (90th)," and the rest of 58 calls will be summed using 95th percentile to get "Number of Positive Foods (95th)." Then, within each replicate, "Number of Positive Foods (90th)" and "Number of Positive Foods (95th)" will be summarized across subjects to get descriptive statistics for each replicate as follows: 1) overall means equals to the mean of means, 2) overall standard deviation equals to the mean of standard deviations, 3) overall medial equals to the mean of medians, 4) overall minimum equals to the minimum of minimums, and 5) overall maximum equals to maximum of maximum. In this analysis, to avoid non-integer "Number of Positive Foods" when computing frequency distribution and histogram, the authors will pretend that the 1000 repetitions of the same original dataset were actually 999 sets of new subjects of the same size added to the original sample. Once the summarization of data is done, frequency distributions and histograms will be generated for both "Number of Positive Foods (90th)" and "Number of Positive Foods (95th)" for both genders and for both Ulcerative Colitis subjects and control subjects using programs "a_pos_foods.sas, a_pos_foods_by_dx.sas".

[00110] Method for measuring diagnostic performance: To measure diagnostic performance for each food items for each subject, we will use data of "Number of Positive Foods (90th)" and "Number of Positive Foods (95th)" for each subject within each bootstrap replicate described above. In this analysis, the cutpoint was set to 1. Thus, if a subject has one or more "Number of Positive Foods (90th)", then the subject will be called "Has Ulcerative Colitis." If a subject has less than one "Number of Positive Foods (90th)", then the subject will be called "Does Not Have Ulcerative Colitis." When all calls were made, the calls were compared with actual diagnosis to determine whether a call was a True Positive (TP), True Negative (TN), False Positive (FP), or False Negative (FN). The comparisons will be summarized across subjects to get the performance metrics of sensitivity, specificity, positive predictive value, and negative predictive value for both "Number of Positive Foods (90th)" and "Number of Positive Foods(95th)" when the cutpoint is set to 1 for each method. Each (sensitivity, 1-specificity) pair becomes a point on the ROC curve for this replicate.

[00111] To increase the accuracy, the analysis above will be repeated by incrementing cutpoint from 2 up to 58, and repeated for each of the 1000 bootstrap replicates. Then the performance metrics across the 1000 bootstrap replicates will be summarized by calculating averages using a program "t_pos_foods_by_dx.sas". The results of diagnostic performance

for female and male are shown in **Tables 13A and 13B** (90th percentile) and **Tables 14A and 14B** (95th percentile).

[00112] Of course, it should be appreciated that certain variations in the food preparations may be made without altering the inventive subject matter presented herein. For example, where the food item was yellow onion, that item should be understood to also include other onion varieties that were demonstrated to have equivalent activity in the tests. Indeed, the inventors have noted that for each tested food preparation, certain other related food preparations also tested in the same or equivalent manner (data not shown). Thus, it should be appreciated that each tested and claimed food preparation will have equivalent related preparations with demonstrated equal or equivalent reactions in the test.

[00113] It should be apparent to those skilled in the art that many more modifications besides those already described are possible without departing from the inventive concepts herein. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims. Moreover, in interpreting both the specification and the claims, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms "comprises" and "comprising" should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced. Where the specification claims refers to at least one of something selected from the group consisting of A, B, C .... and N, the text should be interpreted as requiring only one element from the group, not A plus N, or B plus N, etc.

Abalone
Adlay
Almond
American Cheese
Apple
Artichoke
Asparagus
Avocado
Baby Bok Choy
Bamboo shoots
Banana
Barley, whole grain
Beef
Beets
Beta-lactoglobulin
Blueberry
Broccoli
Buckwheat
Butter
Cabbage
Cane sugar
Cantaloupe
Caraway
Carrot
Casein
Cashew
Cauliflower
Celery
Chard
Cheddar Cheese
Chick Peas
Chicken
Chili pepper
Chocolate
Cinnamon
Clam
Cocoa Bean
Coconut
Codfish
Coffee
Cola nut
Corn
Cottage cheese
Cow's milk
Crab
Cucumber
Cured Cheese
Cuttlefish
Duck
Durian
Eel
Egg White (separate)
Egg Yolk (separate)
Egg, white/yolk (comb.)
Eggplant
Garlic
Ginger
Gluten - Gliadin
Goat's milk
Grape, white/concord
Grapefruit
Grass Carp
Green Onion
Green pea
Green pepper
Guava
Hair Tail
Hake
Halibut
Hazelnut
Honey
Kelp
Kidney bean
Kiwi Fruit
Lamb
Leek
Lemon
Lentils
Lettuce, Iceberg
Lima bean
Lobster
Longan
Mackerel
Malt
Mango
Marjoram
Millet
Mung bean
Mushroom
Mustard seed
Oat
Olive
Onion
Orange
Oyster
Papaya
Paprika
Parsley
Peach
Peanut
Pear
Pepper, Black
Pineapple
Pinto bean
Plum
Pork
Potato
Rabbit
Rice
Roquefort Cheese
Rye
Saccharine
Safflower seed
Salmon
Sardine
Scallop
Sesame
Shark fin
Sheep's milk
Shrimp
Sole
Soybean
Spinach
Squashes
Squid
Strawberry
String bean
Sunflower seed
Sweet potato
Swiss cheese
Taro
Tea, black
Tobacco
Tomato
Trout
Tuna
Turkey
Vanilla
Walnut, black
Watermelon
Welch Onion
Wheat
Wheat bran
Yeast (S. cerevisiae)
Yogurt

FOOD ADDITIVES
Arabic Gum
Carboxymethyl Cellulose
Carrageneenan
FD&C Blue #1
FD&C Red #3
FD&C Red #40
FD&C Yellow #5
FD&C Yellow #6
Gelatin
Guar Gum
Maltodextrin
Pectin
Whey
Xanthan Gum

Table 1

Ranking of Foods according to 2-tailed Permutation T-test p-values with FDR adjustment

Rank	*Food*	*Raw p-value*	*FDR Multiplicity-adj p-value*
1	Green_Pea	0.0000	0.0000
2	Cantaloupe	0.0000	0.0009
3	Pinto_Bean	0.0001	0.0021
4	Cucumber	0.0001	0.0021
5	Green_Pepper	0.0001	0.0021
6	Grapefruit	0.0002	0.0021
7	Carrot	0.0002	0.0021
8	Orange	0.0002	0.0021
9	Almond	0.0002	0.0021
10	Sardine	0.0003	0.0021
11	Sweet_Pot_	0.0003	0.0021
12	Broccoli	0.0003	0.0021
13	Garlic	0.0003	0.0021
14	Lima_Bean	0.0003	0.0021
15	Squashes	0.0004	0.0024
16	Celery	0.0004	0.0025
17	String_Bean	0.0006	0.0030
18	Tomato	0.0008	0.0040
19	Cauliflower	0.0009	0.0041
20	Walnut_Blk	0.0010	0.0046
21	Sunflower_Sd	0.0012	0.0051
22	Cane_Sugar	0.0012	0.0051
23	Buck_Wheat	0.0028	0.0106
24	Soybean	0.0028	0.0106
25	Lemon	0.0030	0.0108
26	Barley	0.0047	0.0163
27	Oat	0.0051	0.0170
28	Oyster	0.0055	0.0173
29	Mustard	0.0056	0.0173
30	Rye	0.0058	0.0173
31	Peach	0.0068	0.0196
32	Chili_Pepper	0.0072	0.0201

Rank	Food	Raw p-value	FDR Multiplicity-adj p-value
33	Spinach	0.0082	0.0222
34	Peanut	0.0084	0.0222
35	Avocado	0.0088	0.0226
36	Shrimp	0.0094	0.0236
37	Pineapple	0.0098	0.0239
38	Cola_Nut	0.0118	0.0275
39	Rice	0.0119	0.0275
40	Cabbage	0.0131	0.0294
41	Butter	0.0150	0.0330
42	Eggplant	0.0156	0.0330
43	Apple	0.0158	0.0330
44	Egg	0.0176	0.0359
45	Wheat	0.0215	0.0419
46	Cottage_Ch_	0.0219	0.0419
47	Sole	0.0219	0.0419
48	Cashew	0.0238	0.0446
49	Olive	0.0259	0.0476
50	Parsley	0.0276	0.0496
51	Corn	0.0340	0.0578
52	Honey	0.0340	0.0578
53	Chocolate	0.0345	0.0578
54	Cow_Milk	0.0347	0.0578
55	Potato	0.0359	0.0587
56	Onion	0.0467	0.0750
57	Tea	0.0506	0.0799
58	Tobacco	0.0625	0.0970
59	Banana	0.0706	0.1078
60	Strawberry	0.0751	0.1127
61	Coffee	0.0771	0.1138
62	Malt	0.0823	0.1195
63	Scallop	0.0887	0.1268
64	Chicken	0.0987	0.1388
65	Yeast_Baker	0.1152	0.1595
66	Millet	0.1171	0.1597
67	Swiss_Ch_	0.1770	0.2378
68	Turkey	0.1806	0.2381
69	Cheddar_Ch_	0.1826	0.2381

Rank	*Food*	*Raw p-value*	*FDR Multiplicity-adj p-value*
70	Yeast_Brewer	0.2178	0.2801
71	Yogurt	0.2255	0.2859
72	Cinnamon	0.2600	0.3250
73	Clam	0.2998	0.3696
74	Tuna	0.3102	0.3762
75	Beef	0.3135	0.3762
76	Lettuce	0.3266	0.3868
77	Trout	0.3672	0.4292
78	Safflower	0.4487	0.5178
79	Codfish	0.4712	0.5368
80	Salmon	0.5076	0.5711
81	Mushroom	0.5634	0.6260
82	Grape	0.5825	0.6389
83	Blueberry	0.5892	0.6389
84	Pork	0.7160	0.7667
85	Sesame	0.7241	0.7667
86	Amer__Cheese	0.7739	0.8099
87	Lobster	0.7946	0.8220
88	Halibut	0.8497	0.8690
89	Goat_Milk	0.9112	0.9215
90	Crab	0.9888	0.9888

Table 2

Basic Descriptive Statistics of ELISA Score by Food and Gender Comparing Ulcerative Colitis to Control

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
FEMALE	Almond	Ulcerative_Colitis	57	10.079	25.036	0.439	158.47
		Control	66	4.034	2.187	0.100	13.068
		Diff (1-2)	_	6.045	17.107	_	_
	Amer__Cheese	Ulcerative_Colitis	57	21.630	31.036	1.602	140.07
		Control	66	23.434	52.616	0.100	400.00
		Diff (1-2)	_	-1.804	43.965	_	_
	Apple	Ulcerative_Colitis	57	5.340	4.304	0.493	28.693
		Control	66	4.432	3.291	0.100	15.890
		Diff (1-2)	_	0.908	3.793	_	_
	Avocado	Ulcerative_Colitis	57	3.858	3.507	0.100	21.077
		Control	66	2.930	2.339	0.100	14.256
		Diff (1-2)	_	0.927	2.938	_	_
	Banana	Ulcerative_Colitis	57	19.827	46.868	0.100	256.94
		Control	66	8.063	14.962	0.100	83.654
		Diff (1-2)	_	11.765	33.717	_	_
	Barley	Ulcerative_Colitis	57	25.942	30.538	1.974	165.95
		Control	66	19.090	12.984	3.026	64.831
		Diff (1-2)	_	6.851	22.851	_	_
	Beef	Ulcerative_Colitis	57	11.027	14.479	1.479	83.266
		Control	66	10.288	13.960	3.026	104.76
		Diff (1-2)	_	0.739	14.202	_	_
	Blueberry	Ulcerative_Colitis	57	5.142	3.166	1.206	17.780
		Control	66	5.440	3.773	0.100	26.772
		Diff (1-2)	_	-0.298	3.505	_	_
	Broccoli	Ulcerative_Colitis	57	11.435	15.944	1.355	99.132
		Control	66	6.280	5.292	0.100	36.378
		Diff (1-2)	_	5.154	11.520	_	_
	Buck_Wheat	Ulcerative_Colitis	57	12.377	18.040	1.848	104.34
		Control	66	8.034	4.990	1.316	29.397
		Diff (1-2)	_	4.342	12.806	_	_
	Butter	Ulcerative_Colitis	57	25.891	26.436	3.865	154.85
		Control	66	21.874	29.162	0.100	204.33
		Diff (1-2)	_	4.017	27.933	_	_
	Cabbage	Ulcerative_Colitis	57	13.302	23.916	0.123	135.74
		Control	66	7.362	10.123	0.100	56.932

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Diff (1-2)	_	5.940	17.882	_	_
	Cane_Sugar	Ulcerative_Colitis	57	32.174	30.535	8.009	178.78
		Control	66	18.288	9.172	2.632	43.466
		Diff (1-2)	_	13.885	21.833	_	_
	Cantaloupe	Ulcerative_Colitis	57	12.200	20.373	0.751	149.18
		Control	66	6.154	6.160	0.100	48.752
		Diff (1-2)	_	6.046	14.576	_	_
	Carrot	Ulcerative_Colitis	57	6.467	6.804	0.987	47.767
		Control	66	4.813	3.705	0.100	24.141
		Diff (1-2)	_	1.654	5.367	_	_
	Cashew	Ulcerative_Colitis	57	12.920	21.204	0.966	98.745
		Control	66	9.924	16.382	0.100	94.907
		Diff (1-2)	_	2.996	18.768	_	_
	Cauliflower	Ulcerative_Colitis	57	9.756	18.230	0.100	131.25
		Control	66	5.977	8.336	0.100	58.808
		Diff (1-2)	_	3.778	13.825	_	_
	Celery	Ulcerative_Colitis	57	12.601	15.076	3.080	107.65
		Control	66	9.634	5.975	0.395	32.141
		Diff (1-2)	_	2.967	11.152	_	_
	Cheddar_Ch_	Ulcerative_Colitis	57	32.153	50.450	1.833	266.75
		Control	66	26.852	55.697	0.100	400.00
		Diff (1-2)	_	5.302	53.333	_	_
	Chicken	Ulcerative_Colitis	57	21.024	19.326	3.865	106.76
		Control	66	18.303	10.514	4.743	61.887
		Diff (1-2)	_	2.721	15.240	_	_
	Chili_Pepper	Ulcerative_Colitis	57	9.931	9.801	1.517	56.432
		Control	66	8.577	7.784	0.100	42.583
		Diff (1-2)	_	1.355	8.775	_	_
	Chocolate	Ulcerative_Colitis	57	18.043	15.319	3.510	71.901
		Control	66	14.350	6.578	3.006	35.317
		Diff (1-2)	_	3.693	11.483	_	_
	Cinnamon	Ulcerative_Colitis	57	34.013	22.107	5.090	119.22
		Control	66	32.170	24.180	5.374	132.49
		Diff (1-2)	_	1.843	23.244	_	_
	Clam	Ulcerative_Colitis	57	39.841	37.147	9.968	197.01
		Control	66	52.166	58.253	7.819	400.00
		Diff (1-2)	_	-12.324	49.614	_	_

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
	Codfish	Ulcerative_Colitis	57	17.321	10.395	3.450	50.000
		Control	66	29.652	31.720	6.200	168.28
		Diff (1-2)	_	-12.330	24.300	_	_
	Coffee	Ulcerative_Colitis	57	38.327	69.479	2.523	400.00
		Control	66	29.631	46.880	5.215	346.81
		Diff (1-2)	_	8.696	58.436	_	_
	Cola_Nut	Ulcerative_Colitis	57	35.111	16.941	14.321	94.417
		Control	66	29.138	12.588	8.723	58.129
		Diff (1-2)	_	5.972	14.763	_	_
	Corn	Ulcerative_Colitis	57	21.320	39.276	1.426	231.14
		Control	66	11.407	23.137	0.100	187.68
		Diff (1-2)	_	9.913	31.646	_	_
	Cottage_Ch_	Ulcerative_Colitis	57	93.700	117.494	2.594	400.00
		Control	66	76.158	92.333	0.100	400.00
		Diff (1-2)	_	17.543	104.732	_	_
	Cow_Milk	Ulcerative_Colitis	57	85.720	104.244	0.682	400.00
		Control	66	75.882	86.959	0.100	400.00
		Diff (1-2)	_	9.838	95.349	_	_
	Crab	Ulcerative_Colitis	57	19.921	13.939	4.440	70.735
		Control	66	23.583	17.654	3.803	93.236
		Diff (1-2)	_	-3.661	16.042	_	_
	Cucumber	Ulcerative_Colitis	57	16.195	18.948	1.232	120.91
		Control	66	8.461	8.149	0.100	38.939
		Diff (1-2)	_	7.735	14.207	_	_
	Egg	Ulcerative_Colitis	57	85.576	122.235	2.451	400.00
		Control	66	55.102	89.966	0.100	400.00
		Diff (1-2)	_	30.475	106.127	_	_
	Eggplant	Ulcerative_Colitis	57	9.361	12.488	0.100	69.989
		Control	66	5.732	5.993	0.100	31.330
		Diff (1-2)	_	3.628	9.564	_	_
	Garlic	Ulcerative_Colitis	57	20.485	17.805	2.413	90.456
		Control	66	11.174	5.779	3.380	28.482
		Diff (1-2)	_	9.310	12.832	_	_
	Goat_Milk	Ulcerative_Colitis	57	13.970	15.091	1.146	78.345
		Control	66	15.413	28.452	0.100	180.08
		Diff (1-2)	_	-1.443	23.243	_	_
	Grape	Ulcerative_Colitis	57	20.135	11.537	4.169	78.950

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Control	66	20.276	6.827	10.650	47.817
		Diff (1-2)	_	-0.141	9.308	_	_
	Grapefruit	Ulcerative_Colitis	57	5.675	9.301	0.100	68.905
		Control	66	3.278	2.446	0.100	14.364
		Diff (1-2)	_	2.397	6.576	_	_
	Green_Pea	Ulcerative_Colitis	57	15.251	15.940	0.658	79.774
		Control	66	8.631	7.160	0.496	32.502
		Diff (1-2)	_	6.620	12.047	_	_
	Green_Pepper	Ulcerative_Colitis	57	7.641	14.196	0.100	107.26
		Control	66	4.149	2.875	0.100	14.364
		Diff (1-2)	_	3.492	9.885	_	_
	Halibut	Ulcerative_Colitis	57	10.765	5.076	2.587	27.746
		Control	66	11.119	7.129	2.729	44.884
		Diff (1-2)	_	-0.354	6.263	_	_
	Honey	Ulcerative_Colitis	57	12.330	7.625	2.742	37.290
		Control	66	10.185	4.203	4.227	19.876
		Diff (1-2)	_	2.145	6.033	_	_
	Lemon	Ulcerative_Colitis	57	3.296	3.105	0.100	22.003
		Control	66	2.482	2.159	0.100	14.688
		Diff (1-2)	_	0.814	2.639	_	_
	Lettuce	Ulcerative_Colitis	57	11.835	9.147	2.711	59.964
		Control	66	11.368	6.472	0.921	29.851
		Diff (1-2)	_	0.467	7.825	_	_
	Lima_Bean	Ulcerative_Colitis	57	10.268	8.919	0.329	39.575
		Control	66	6.624	8.761	0.100	65.634
		Diff (1-2)	_	3.643	8.835	_	_
	Lobster	Ulcerative_Colitis	57	12.931	10.997	1.181	62.481
		Control	66	13.398	8.359	3.938	46.560
		Diff (1-2)	_	-0.468	9.670	_	_
	Malt	Ulcerative_Colitis	57	23.676	17.406	5.814	105.68
		Control	66	21.743	11.326	3.684	57.151
		Diff (1-2)	_	1.933	14.461	_	_
	Millet	Ulcerative_Colitis	57	5.424	5.233	0.487	27.187
		Control	66	4.889	7.091	0.100	46.663
		Diff (1-2)	_	0.535	6.299	_	_
	Mushroom	Ulcerative_Colitis	57	9.754	12.339	0.100	69.107
		Control	66	13.174	12.549	1.117	49.656

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Diff (1-2)	_	-3.419	12.452	_	_
	Mustard	Ulcerative_Colitis	57	11.854	15.378	2.545	98.146
		Control	66	8.842	5.224	0.100	23.452
		Diff (1-2)	_	3.011	11.140	_	_
	Oat	Ulcerative_Colitis	57	40.965	76.954	0.768	400.00
		Control	66	16.237	14.506	0.100	76.165
		Diff (1-2)	_	24.727	53.421	_	_
	Olive	Ulcerative_Colitis	57	31.615	30.330	3.573	180.11
		Control	66	23.704	14.281	5.272	59.488
		Diff (1-2)	_	7.911	23.137	_	_
	Onion	Ulcerative_Colitis	57	17.905	24.231	0.438	119.13
		Control	66	11.329	16.935	1.184	114.37
		Diff (1-2)	_	6.576	20.635	_	_
	Orange	Ulcerative_Colitis	57	26.028	25.192	1.206	112.32
		Control	66	15.289	11.608	1.489	47.125
		Diff (1-2)	_	10.738	19.134	_	_
	Oyster	Ulcerative_Colitis	57	63.062	63.526	4.608	372.89
		Control	66	42.674	33.485	5.656	168.59
		Diff (1-2)	_	20.388	49.699	_	_
	Parsley	Ulcerative_Colitis	57	6.938	11.992	0.100	70.169
		Control	66	5.005	6.541	0.100	34.932
		Diff (1-2)	_	1.933	9.462	_	_
	Peach	Ulcerative_Colitis	57	13.457	20.732	0.123	124.35
		Control	66	7.145	7.742	0.100	33.820
		Diff (1-2)	_	6.312	15.203	_	_
	Peanut	Ulcerative_Colitis	57	14.262	48.433	0.219	349.73
		Control	66	5.563	4.941	0.100	26.567
		Diff (1-2)	_	8.699	33.147	_	_
	Pineapple	Ulcerative_Colitis	57	53.335	86.808	0.329	400.00
		Control	66	23.710	46.114	0.100	278.44
		Diff (1-2)	_	29.626	68.044	_	_
	Pinto_Bean	Ulcerative_Colitis	57	16.597	22.820	2.254	152.98
		Control	66	10.138	8.167	0.100	48.623
		Diff (1-2)	_	6.459	16.639	_	_
	Pork	Ulcerative_Colitis	57	15.004	15.800	2.962	80.448
		Control	66	15.347	10.345	4.339	65.759
		Diff (1-2)	_	-0.343	13.154	_	_

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
	Potato	Ulcerative_Colitis	57	17.934	24.208	4.278	183.78
		Control	66	13.615	6.063	6.200	40.802
		Diff (1-2)	_	4.318	17.058	_	_
	Rice	Ulcerative_Colitis	57	31.549	49.019	6.184	362.21
		Control	66	21.551	16.950	3.350	92.642
		Diff (1-2)	_	9.998	35.587	_	_
	Rye	Ulcerative_Colitis	57	6.931	12.152	1.338	92.310
		Control	66	5.237	3.633	0.100	22.824
		Diff (1-2)	_	1.694	8.685	_	_
	Safflower	Ulcerative_Colitis	57	8.917	6.880	2.531	41.242
		Control	66	8.776	8.189	1.722	48.833
		Diff (1-2)	_	0.140	7.611	_	_
	Salmon	Ulcerative_Colitis	57	9.369	6.906	2.413	44.560
		Control	66	9.377	7.261	2.862	56.530
		Diff (1-2)	_	-0.008	7.099	_	_
	Sardine	Ulcerative_Colitis	57	44.148	20.802	12.069	102.96
		Control	66	37.084	16.695	7.190	88.964
		Diff (1-2)	_	7.064	18.708	_	_
	Scallop	Ulcerative_Colitis	57	61.726	39.681	14.451	165.26
		Control	66	64.291	29.551	18.605	148.58
		Diff (1-2)	_	-2.565	34.610	_	_
	Sesame	Ulcerative_Colitis	57	73.122	118.220	0.100	400.00
		Control	66	80.704	93.902	5.984	400.00
		Diff (1-2)	_	-7.582	105.854	_	_
	Shrimp	Ulcerative_Colitis	57	21.492	22.231	1.717	137.49
		Control	66	33.150	27.875	6.607	113.66
		Diff (1-2)	_	-11.658	25.419	_	_
	Sole	Ulcerative_Colitis	57	6.020	3.293	1.316	20.885
		Control	66	6.440	6.960	0.100	54.883
		Diff (1-2)	_	-0.419	5.571	_	_
	Soybean	Ulcerative_Colitis	57	21.445	26.605	4.187	187.77
		Control	66	15.294	9.373	2.481	49.071
		Diff (1-2)	_	6.151	19.360	_	_
	Spinach	Ulcerative_Colitis	57	26.961	49.539	6.802	367.99
		Control	66	20.485	13.172	6.051	66.626
		Diff (1-2)	_	6.476	35.057	_	_
	Squashes	Ulcerative_Colitis	57	17.555	11.532	4.059	53.553

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Control	66	13.415	11.597	1.842	74.279
		Diff (1-2)	_	4.140	11.567	_	_
	Strawberry	Ulcerative_Colitis	57	6.064	5.341	0.100	28.233
		Control	66	5.563	5.305	0.100	35.745
		Diff (1-2)	_	0.501	5.321	_	_
	String_Bean	Ulcerative_Colitis	57	54.019	30.799	7.680	149.68
		Control	66	41.957	22.678	9.539	125.69
		Diff (1-2)	_	12.063	26.744	_	_
	Sunflower_Sd	Ulcerative_Colitis	57	15.717	21.185	2.084	103.84
		Control	66	9.948	6.094	2.632	33.347
		Diff (1-2)	_	5.769	15.089	_	_
	Sweet_Pot_	Ulcerative_Colitis	57	13.118	18.306	2.218	138.11
		Control	66	8.592	4.479	0.395	25.009
		Diff (1-2)	_	4.525	12.879	_	_
	Swiss_Ch_	Ulcerative_Colitis	57	49.090	77.461	2.316	400.00
		Control	66	39.219	73.725	0.100	400.00
		Diff (1-2)	_	9.871	75.477	_	_
	Tea	Ulcerative_Colitis	57	35.381	24.818	12.508	160.22
		Control	66	29.771	12.014	11.634	64.535
		Diff (1-2)	_	5.610	19.042	_	_
	Tobacco	Ulcerative_Colitis	57	39.527	26.849	10.906	135.98
		Control	66	33.566	16.789	7.809	82.097
		Diff (1-2)	_	5.961	22.024	_	_
	Tomato	Ulcerative_Colitis	57	15.238	16.813	2.218	107.39
		Control	66	9.066	7.694	0.100	42.078
		Diff (1-2)	_	6.172	12.753	_	_
	Trout	Ulcerative_Colitis	57	13.805	8.087	3.749	47.896
		Control	66	16.138	10.667	5.596	76.221
		Diff (1-2)	_	-2.333	9.560	_	_
	Tuna	Ulcerative_Colitis	57	15.838	10.358	2.254	56.001
		Control	66	18.092	12.707	3.873	64.090
		Diff (1-2)	_	-2.253	11.679	_	_
	Turkey	Ulcerative_Colitis	57	16.023	14.275	3.006	95.919
		Control	66	14.461	6.976	4.094	32.151
		Diff (1-2)	_	1.561	10.975	_	_
	Walnut_Blk	Ulcerative_Colitis	57	40.389	58.256	8.009	400.00
		Control	66	25.386	17.254	6.943	117.46

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Diff (1-2)	_	15.003	41.601	_	_
	Wheat	Ulcerative_Colitis	57	25.837	67.552	2.304	400.00
		Control	66	18.402	29.364	0.790	209.95
		Diff (1-2)	_	7.435	50.746	_	_
	Yeast_Baker	Ulcerative_Colitis	57	12.519	30.904	1.316	223.99
		Control	66	5.545	3.349	0.526	18.811
		Diff (1-2)	_	6.974	21.167	_	_
	Yeast_Brewer	Ulcerative_Colitis	57	25.350	61.479	2.194	400.00
		Control	66	10.847	7.818	0.100	43.887
		Diff (1-2)	_	14.503	42.215	_	_
	Yogurt	Ulcerative_Colitis	57	21.430	20.338	4.240	101.82
		Control	66	22.930	30.973	0.100	215.73
		Diff (1-2)	_	-1.500	26.585	_	_
MALE	Almond	Ulcerative_Colitis	46	9.713	10.631	0.100	48.413
		Control	97	4.049	2.231	0.100	12.591
		Diff (1-2)	_	5.664	6.282	_	_
	Amer__Cheese	Ulcerative_Colitis	46	27.588	27.243	0.100	105.40
		Control	97	22.619	34.069	0.468	197.38
		Diff (1-2)	_	4.969	32.049	_	_
	Apple	Ulcerative_Colitis	46	5.840	4.036	0.100	20.284
		Control	97	4.383	2.900	0.100	13.795
		Diff (1-2)	_	1.457	3.305	_	_
	Avocado	Ulcerative_Colitis	46	3.569	2.010	0.100	11.275
		Control	97	2.720	2.992	0.100	28.693
		Diff (1-2)	_	0.849	2.717	_	_
	Banana	Ulcerative_Colitis	46	11.987	18.952	0.100	96.512
		Control	97	8.576	36.151	0.100	350.69
		Diff (1-2)	_	3.411	31.693	_	_
	Barley	Ulcerative_Colitis	46	37.135	58.378	0.100	400.00
		Control	97	19.214	11.923	4.612	58.865
		Diff (1-2)	_	17.921	34.416	_	_
	Beef	Ulcerative_Colitis	46	12.163	15.192	0.100	89.210
		Control	97	9.327	11.981	2.059	93.494
		Diff (1-2)	_	2.836	13.092	_	_
	Blueberry	Ulcerative_Colitis	46	6.305	4.453	0.100	26.859
		Control	97	5.393	2.868	0.100	19.410
		Diff (1-2)	_	0.911	3.454	_	_

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
	Broccoli	Ulcerative_Colitis	46	10.771	6.468	0.100	29.342
		Control	97	6.790	8.012	0.131	72.543
		Diff (1-2)	_	3.981	7.554	_	_
	Buck_Wheat	Ulcerative_Colitis	46	9.904	5.030	0.100	23.189
		Control	97	6.978	3.384	2.656	24.338
		Diff (1-2)	_	2.926	3.984	_	_
	Butter	Ulcerative_Colitis	46	28.310	23.146	2.104	87.745
		Control	97	17.846	20.091	1.490	131.60
		Diff (1-2)	_	10.464	21.114	_	_
	Cabbage	Ulcerative_Colitis	46	11.079	9.922	0.100	41.324
		Control	97	6.540	18.133	0.100	174.96
		Diff (1-2)	_	4.539	15.977	_	_
	Cane_Sugar	Ulcerative_Colitis	46	28.481	24.975	2.955	147.61
		Control	97	22.356	18.718	2.789	100.82
		Diff (1-2)	_	6.125	20.919	_	_
	Cantaloupe	Ulcerative_Colitis	46	12.177	10.882	0.100	60.013
		Control	97	6.052	5.569	0.468	38.706
		Diff (1-2)	_	6.126	7.675	_	_
	Carrot	Ulcerative_Colitis	46	9.182	8.539	0.100	50.970
		Control	97	4.684	3.636	0.468	28.593
		Diff (1-2)	_	4.498	5.681	_	_
	Cashew	Ulcerative_Colitis	46	17.599	28.317	0.100	167.72
		Control	97	8.362	10.271	0.100	55.749
		Diff (1-2)	_	9.237	18.103	_	_
	Cauliflower	Ulcerative_Colitis	46	9.803	9.337	0.100	42.378
		Control	97	4.385	4.396	0.100	36.593
		Diff (1-2)	_	5.418	6.402	_	_
	Celery	Ulcerative_Colitis	46	16.290	11.968	0.100	52.534
		Control	97	8.930	4.985	2.394	26.982
		Diff (1-2)	_	7.360	7.914	_	_
	Cheddar_Ch_	Ulcerative_Colitis	46	41.438	45.998	0.100	208.47
		Control	97	28.479	49.022	1.169	298.91
		Diff (1-2)	_	12.959	48.077	_	_
	Chicken	Ulcerative_Colitis	46	21.425	15.312	0.100	71.379
		Control	97	17.778	11.456	5.137	69.503
		Diff (1-2)	_	3.646	12.813	_	_
	Chili_Pepper	Ulcerative_Colitis	46	13.087	11.692	0.100	61.496

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Control	97	7.802	5.945	1.591	31.070
		Diff (1-2)	_	5.286	8.227	_	_
	Chocolate	Ulcerative_Colitis	46	20.511	13.811	0.100	69.232
		Control	97	16.536	11.276	1.726	63.673
		Diff (1-2)	_	3.975	12.143	_	_
	Cinnamon	Ulcerative_Colitis	46	43.331	30.200	7.718	117.58
		Control	97	35.928	28.520	3.136	146.95
		Diff (1-2)	_	7.403	29.067	_	_
	Clam	Ulcerative_Colitis	46	38.009	28.872	3.421	121.47
		Control	97	38.293	21.598	6.370	103.47
		Diff (1-2)	_	-0.284	24.159	_	_
	Codfish	Ulcerative_Colitis	46	26.039	20.205	0.100	86.059
		Control	97	22.538	29.644	4.176	269.16
		Diff (1-2)	_	3.501	26.992	_	_
	Coffee	Ulcerative_Colitis	46	34.715	62.443	3.884	400.00
		Control	97	20.037	24.002	2.705	192.24
		Diff (1-2)	_	14.679	40.455	_	_
	Cola_Nut	Ulcerative_Colitis	46	38.888	16.023	11.891	84.315
		Control	97	32.919	20.025	3.851	112.10
		Diff (1-2)	_	5.969	18.840	_	_
	Corn	Ulcerative_Colitis	46	13.329	9.353	0.100	53.955
		Control	97	10.126	15.048	1.520	117.90
		Diff (1-2)	_	3.203	13.494	_	_
	Cottage_Ch_	Ulcerative_Colitis	46	127.105	127.624	1.867	400.00
		Control	97	74.814	101.386	1.446	400.00
		Diff (1-2)	_	52.292	110.439	_	_
	Cow_Milk	Ulcerative_Colitis	46	115.427	111.909	2.595	400.00
		Control	97	68.606	94.032	1.343	400.00
		Diff (1-2)	_	46.821	100.085	_	_
	Crab	Ulcerative_Colitis	46	29.571	61.851	2.104	400.00
		Control	97	24.550	29.311	3.108	252.41
		Diff (1-2)	_	5.021	42.496	_	_
	Cucumber	Ulcerative_Colitis	46	13.314	9.189	0.100	39.378
		Control	97	8.320	9.298	0.234	69.188
		Diff (1-2)	_	4.994	9.263	_	_
	Egg	Ulcerative_Colitis	46	71.044	98.867	0.935	400.00
		Control	97	44.335	66.828	0.100	400.00

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Diff (1-2)	_	26.709	78.487	_	_
	Eggplant	Ulcerative_Colitis	46	8.891	11.349	0.100	74.721
		Control	97	5.856	10.455	0.100	92.376
		Diff (1-2)	_	3.035	10.749	_	_
	Garlic	Ulcerative_Colitis	46	17.749	14.628	0.100	72.515
		Control	97	13.476	12.122	3.097	70.591
		Diff (1-2)	_	4.274	12.975	_	_
	Goat_Milk	Ulcerative_Colitis	46	21.482	21.250	0.100	81.830
		Control	97	17.999	36.202	0.100	275.19
		Diff (1-2)	_	3.483	32.194	_	_
	Grape	Ulcerative_Colitis	46	22.888	11.749	0.100	71.188
		Control	97	23.308	7.422	11.900	41.654
		Diff (1-2)	_	-0.420	9.031	_	_
	Grapefruit	Ulcerative_Colitis	46	5.464	4.181	0.100	20.502
		Control	97	3.049	2.306	0.100	14.648
		Diff (1-2)	_	2.415	3.033	_	_
	Green_Pea	Ulcerative_Colitis	46	19.698	18.404	0.100	78.678
		Control	97	9.229	11.366	0.100	71.765
		Diff (1-2)	_	10.469	14.002	_	_
	Green_Pepper	Ulcerative_Colitis	46	7.397	6.122	0.100	27.348
		Control	97	3.972	2.664	0.100	15.744
		Diff (1-2)	_	3.425	4.098	_	_
	Halibut	Ulcerative_Colitis	46	14.268	13.472	0.100	81.343
		Control	97	12.657	15.451	0.818	142.09
		Diff (1-2)	_	1.611	14.848	_	_
	Honey	Ulcerative_Colitis	46	12.703	6.605	0.100	33.490
		Control	97	11.082	6.215	2.434	31.202
		Diff (1-2)	_	1.620	6.343	_	_
	Lemon	Ulcerative_Colitis	46	3.113	1.709	0.100	7.749
		Control	97	2.310	1.436	0.100	8.383
		Diff (1-2)	_	0.803	1.528	_	_
	Lettuce	Ulcerative_Colitis	46	12.892	7.188	0.100	29.846
		Control	97	11.271	8.295	2.871	52.209
		Diff (1-2)	_	1.621	7.958	_	_
	Lima_Bean	Ulcerative_Colitis	46	8.928	5.835	0.100	29.759
		Control	97	5.994	5.650	0.100	37.640
		Diff (1-2)	_	2.934	5.710	_	_

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
	Lobster	Ulcerative_Colitis	46	11.944	7.361	0.117	37.739
		Control	97	15.678	11.555	0.468	61.064
		Diff (1-2)	_	-3.734	10.402	_	_
	Malt	Ulcerative_Colitis	46	26.092	17.394	0.100	105.54
		Control	97	21.137	12.373	3.182	58.638
		Diff (1-2)	_	4.955	14.170	_	_
	Millet	Ulcerative_Colitis	46	5.919	7.006	0.100	42.933
		Control	97	4.006	6.783	0.100	67.831
		Diff (1-2)	_	1.913	6.855	_	_
	Mushroom	Ulcerative_Colitis	46	14.755	16.831	0.100	68.603
		Control	97	12.883	12.397	1.350	59.949
		Diff (1-2)	_	1.873	13.966	_	_
	Mustard	Ulcerative_Colitis	46	17.526	26.970	1.089	183.13
		Control	97	9.168	5.413	1.044	28.538
		Diff (1-2)	_	8.358	15.878	_	_
	Oat	Ulcerative_Colitis	46	29.789	33.374	0.100	193.73
		Control	97	20.964	22.946	1.461	107.25
		Diff (1-2)	_	8.825	26.720	_	_
	Olive	Ulcerative_Colitis	46	30.506	20.247	0.139	118.07
		Control	97	24.794	22.708	5.137	160.63
		Diff (1-2)	_	5.711	21.952	_	_
	Onion	Ulcerative_Colitis	46	14.182	12.107	0.100	50.545
		Control	97	11.600	17.551	1.175	158.57
		Diff (1-2)	_	2.583	16.016	_	_
	Orange	Ulcerative_Colitis	46	28.800	21.379	0.100	110.43
		Control	97	17.767	16.361	2.146	79.419
		Diff (1-2)	_	11.034	18.114	_	_
	Oyster	Ulcerative_Colitis	46	63.323	74.746	6.369	357.39
		Control	97	43.016	35.689	5.069	216.58
		Diff (1-2)	_	20.306	51.481	_	_
	Parsley	Ulcerative_Colitis	46	9.862	16.304	0.100	74.199
		Control	97	4.867	7.352	0.100	58.674
		Diff (1-2)	_	4.995	11.029	_	_
	Peach	Ulcerative_Colitis	46	16.604	35.101	0.100	236.47
		Control	97	8.390	8.373	0.100	50.444
		Diff (1-2)	_	8.214	20.999	_	_
	Peanut	Ulcerative_Colitis	46	8.452	9.914	0.100	51.491

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Control	97	4.241	4.514	0.855	41.070
		Diff (1-2)	_	4.211	6.726	_	_
	Pineapple	Ulcerative_Colitis	46	34.321	47.506	0.100	207.41
		Control	97	23.259	48.769	0.100	400.00
		Diff (1-2)	_	11.061	48.370	_	_
	Pinto_Bean	Ulcerative_Colitis	46	14.680	10.767	0.100	49.004
		Control	97	8.132	5.524	0.664	28.288
		Diff (1-2)	_	6.548	7.601	_	_
	Pork	Ulcerative_Colitis	46	14.508	12.409	0.100	73.385
		Control	97	13.403	10.218	1.637	57.274
		Diff (1-2)	_	1.106	10.965	_	_
	Potato	Ulcerative_Colitis	46	18.153	11.266	0.100	55.737
		Control	97	14.555	5.951	5.259	49.002
		Diff (1-2)	_	3.598	8.039	_	_
	Rice	Ulcerative_Colitis	46	43.673	60.315	1.867	400.00
		Control	97	25.220	18.948	5.149	118.12
		Diff (1-2)	_	18.453	37.490	_	_
	Rye	Ulcerative_Colitis	46	11.156	18.678	0.100	113.72
		Control	97	4.801	2.690	0.653	15.288
		Diff (1-2)	_	6.355	10.783	_	_
	Safflower	Ulcerative_Colitis	46	9.950	6.790	0.100	33.143
		Control	97	8.672	6.177	1.958	38.914
		Diff (1-2)	_	1.278	6.379	_	_
	Salmon	Ulcerative_Colitis	46	9.627	5.825	0.100	28.441
		Control	97	10.920	13.350	0.100	125.74
		Diff (1-2)	_	-1.293	11.496	_	_
	Sardine	Ulcerative_Colitis	46	48.386	21.967	10.375	121.32
		Control	97	37.035	15.979	7.037	90.406
		Diff (1-2)	_	11.351	18.106	_	_
	Scallop	Ulcerative_Colitis	46	81.379	44.060	12.717	186.86
		Control	97	60.721	32.618	8.942	167.75
		Diff (1-2)	_	20.658	36.660	_	_
	Sesame	Ulcerative_Colitis	46	72.997	95.118	0.100	400.00
		Control	97	60.406	79.861	2.115	400.00
		Diff (1-2)	_	12.592	85.028	_	_
	Shrimp	Ulcerative_Colitis	46	22.090	14.510	2.955	63.471
		Control	97	34.490	42.689	2.663	342.67

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
		Diff (1-2)	_	-12.400	36.165	_	_
	Sole	Ulcerative_Colitis	46	7.515	4.149	0.100	20.953
		Control	97	4.912	2.238	0.100	14.303
		Diff (1-2)	_	2.603	2.984	_	_
	Soybean	Ulcerative_Colitis	46	26.364	27.186	0.778	141.84
		Control	97	15.880	9.273	4.912	71.264
		Diff (1-2)	_	10.484	17.159	_	_
	Spinach	Ulcerative_Colitis	46	24.393	17.724	2.770	95.908
		Control	97	14.656	7.304	3.054	39.867
		Diff (1-2)	_	9.737	11.687	_	_
	Squashes	Ulcerative_Colitis	46	18.247	11.663	0.100	50.213
		Control	97	12.688	7.539	1.637	49.775
		Diff (1-2)	_	5.558	9.062	_	_
	Strawberry	Ulcerative_Colitis	46	6.490	5.578	0.100	34.770
		Control	97	4.767	4.446	0.100	30.664
		Diff (1-2)	_	1.724	4.836	_	_
	String_Bean	Ulcerative_Colitis	46	59.790	51.398	4.432	325.08
		Control	97	40.720	22.088	5.609	141.76
		Diff (1-2)	_	19.070	34.283	_	_
	Sunflower_Sd	Ulcerative_Colitis	46	21.265	47.116	0.100	326.78
		Control	97	9.071	5.842	2.523	46.948
		Diff (1-2)	_	12.193	27.050	_	_
	Sweet_Pot_	Ulcerative_Colitis	46	13.540	9.152	0.100	38.861
		Control	97	8.456	4.878	0.100	30.052
		Diff (1-2)	_	5.084	6.552	_	_
	Swiss_Ch_	Ulcerative_Colitis	46	62.321	76.987	0.100	353.99
		Control	97	43.413	79.791	0.100	400.00
		Diff (1-2)	_	18.908	78.907	_	_
	Tea	Ulcerative_Colitis	46	34.993	14.697	8.857	76.433
		Control	97	31.353	13.716	8.890	70.271
		Diff (1-2)	_	3.640	14.036	_	_
	Tobacco	Ulcerative_Colitis	46	52.669	54.079	10.677	354.77
		Control	97	39.354	26.787	6.106	134.30
		Diff (1-2)	_	13.315	37.708	_	_
	Tomato	Ulcerative_Colitis	46	19.627	43.625	0.100	301.96
		Control	97	9.088	7.957	0.100	48.338
		Diff (1-2)	_	10.539	25.504	_	_

				ELISA Score			
Sex	*Food*	*Diagnosis*	*N*	*Mean*	*SD*	*Min*	*Max*
	Trout	Ulcerative_Colitis	46	17.035	10.017	0.100	57.313
		Control	97	16.891	15.673	0.100	144.46
		Diff (1-2)	_	0.144	14.116	_	_
	Tuna	Ulcerative_Colitis	46	17.635	11.232	0.100	48.815
		Control	97	18.392	16.755	3.156	110.69
		Diff (1-2)	_	-0.757	15.211	_	_
	Turkey	Ulcerative_Colitis	46	17.700	13.152	0.100	60.557
		Control	97	14.840	10.829	2.789	69.572
		Diff (1-2)	_	2.860	11.621	_	_
	Walnut_Blk	Ulcerative_Colitis	46	41.473	31.581	2.178	146.59
		Control	97	25.520	14.492	4.249	71.927
		Diff (1-2)	_	15.952	21.478	_	_
	Wheat	Ulcerative_Colitis	46	46.983	93.083	0.100	400.00
		Control	97	14.494	12.413	2.741	90.037
		Diff (1-2)	_	32.489	53.574	_	_
	Yeast_Baker	Ulcerative_Colitis	46	11.891	14.388	0.100	81.470
		Control	97	9.617	17.250	1.305	116.43
		Diff (1-2)	_	2.273	16.391	_	_
	Yeast_Brewer	Ulcerative_Colitis	46	25.256	36.449	0.100	190.55
		Control	97	22.646	47.630	1.931	308.34
		Diff (1-2)	_	2.611	44.369	_	_
	Yogurt	Ulcerative_Colitis	46	27.628	20.117	0.100	77.470
		Control	97	19.210	20.751	0.234	120.51
		Diff (1-2)	_	8.418	20.551	_	_

Table 3

Upper Quantiles of ELISA Signal Scores among Control Subjects as Candidates for Test Cutpoints in Determining "Positive" or "Negative"

Top 58 Foods Ranked by Descending order of Discriminatory Ability using Permutation Test

Ulcerative_Colitis Subjects vs. Controls

			Cutpoint	
Food Ranking	*Food*	*Sex*	*90th percentile*	*95th percentile*
1	Green_Pea	FEMALE	20.814	23.684
		MALE	19.788	32.100
2	Cantaloupe	FEMALE	9.672	13.552
		MALE	11.337	16.219
3	Pinto_Bean	FEMALE	18.863	27.923
		MALE	16.119	20.774
4	Cucumber	FEMALE	20.944	26.779
		MALE	17.891	23.472
5	Green_Pepper	FEMALE	8.275	10.402
		MALE	7.054	9.712
6	Grapefruit	FEMALE	6.215	7.611
		MALE	5.330	7.738
7	Carrot	FEMALE	9.212	11.448
		MALE	7.807	10.836
8	Orange	FEMALE	33.707	40.739
		MALE	37.082	56.031
9	Almond	FEMALE	6.751	8.235
		MALE	7.259	8.824
10	Sardine	FEMALE	58.683	73.442
		MALE	57.359	64.811
11	Sweet_Pot_	FEMALE	14.644	17.301
		MALE	13.894	18.378
12	Broccoli	FEMALE	11.826	14.843
		MALE	13.203	15.982
13	Garlic	FEMALE	19.323	22.695
		MALE	27.228	41.008
14	Lima_Bean	FEMALE	12.667	18.798
		MALE	10.738	14.912
15	Squashes	FEMALE	22.217	32.815
		MALE	22.931	26.147
16	Celery	FEMALE	17.085	22.342

Food Ranking	Food	Sex	Cutpoint 90th percentile	Cutpoint 95th percentile
		MALE	15.101	19.687
17	String_Bean	FEMALE	68.618	84.869
		MALE	65.384	83.179
18	Tomato	FEMALE	17.721	23.905
		MALE	18.818	26.329
19	Cauliflower	FEMALE	11.527	17.829
		MALE	8.004	11.222
20	Walnut_Blk	FEMALE	45.008	56.778
		MALE	45.356	56.848
21	Sunflower_Sd	FEMALE	16.611	22.529
		MALE	14.239	18.733
22	Cane_Sugar	FEMALE	29.824	36.249
		MALE	45.468	64.941
23	Buck_Wheat	FEMALE	14.739	18.482
		MALE	11.356	12.773
24	Soybean	FEMALE	30.770	34.674
		MALE	26.301	31.395
25	Lemon	FEMALE	4.556	5.959
		MALE	4.179	5.210
26	Barley	FEMALE	35.136	46.859
		MALE	36.197	45.928
27	Oat	FEMALE	33.278	44.414
		MALE	55.311	72.680
28	Oyster	FEMALE	86.278	114.96
		MALE	82.294	119.88
29	Mustard	FEMALE	17.479	19.400
		MALE	16.227	20.884
30	Rye	FEMALE	8.475	12.141
		MALE	8.360	10.635
31	Peach	FEMALE	17.987	26.936
		MALE	17.616	26.755
32	Chili_Pepper	FEMALE	16.296	25.191
		MALE	14.040	21.503
33	Spinach	FEMALE	37.895	48.052
		MALE	24.957	28.650
34	Peanut	FEMALE	11.190	16.279

Food Ranking	Food	Sex	Cutpoint 90th percentile	Cutpoint 95th percentile
		MALE	6.920	9.159
35	Avocado	FEMALE	5.397	7.247
		MALE	4.483	5.566
36	Shrimp	FEMALE	81.870	98.743
		MALE	69.799	101.18
37	Pineapple	FEMALE	65.230	122.14
		MALE	65.661	106.68
38	Cola_Nut	FEMALE	48.288	53.448
		MALE	59.969	72.288
39	Rice	FEMALE	40.837	58.139
		MALE	52.100	63.388
40	Cabbage	FEMALE	18.343	28.722
		MALE	9.730	18.345
41	Butter	FEMALE	47.381	71.040
		MALE	44.178	58.044
42	Eggplant	FEMALE	12.557	18.816
		MALE	9.359	14.446
43	Apple	FEMALE	9.017	11.837
		MALE	8.631	10.597
44	Egg	FEMALE	144.38	280.18
		MALE	106.91	197.02
45	Wheat	FEMALE	30.663	56.824
		MALE	27.355	37.901
46	Cottage_Ch_	FEMALE	200.80	287.02
		MALE	220.78	348.31
47	Sole	FEMALE	9.355	14.730
		MALE	7.466	9.176
48	Cashew	FEMALE	23.551	44.896
		MALE	17.371	32.259
49	Olive	FEMALE	48.012	55.113
		MALE	42.612	61.277
50	Parsley	FEMALE	11.123	19.965
		MALE	8.545	17.265
51	Corn	FEMALE	20.036	31.057
		MALE	19.953	30.126
52	Honey	FEMALE	16.276	17.419

			Cutpoint	
Food Ranking	*Food*	*Sex*	*90th percentile*	*95th percentile*
		MALE	19.199	24.877
53	Chocolate	FEMALE	23.555	25.869
		MALE	32.644	37.625
54	Cow_Milk	FEMALE	199.39	248.98
		MALE	181.23	316.72
55	Potato	FEMALE	20.155	25.293
		MALE	21.203	24.281
56	Onion	FEMALE	20.204	37.487
		MALE	25.719	33.230
57	Tea	FEMALE	46.116	53.257
		MALE	49.893	56.701
58	Tobacco	FEMALE	57.943	64.379
		MALE	73.610	101.38

Table 4

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile
160905AAC0012	13
160905AAC0013	14
160905AAC0008	37
160905AAC0001	26
160905AAC0003	15
BRH1274374	4
BRH1274378	9
BRH1274380	10
BRH1272208	4
BRH1272209	36
BRH1272210	6
BRH1272213	43
BRH1272218	7
BRH1272220	28
BRH1272223	25
BRH1272224	7
BRH1272225	7
BRH1272226	40
BRH1272227	5
BRH1265975	33
BRH1265977	7
BRH1265978	9
BRH1265979	33
BRH1265980	3
BRH1265982	23
BRH1265983	11
BRH1265985	8
BRH1265987	22
BRH1265988	0
BRH1265992	1
BRH1265995	26
BRH1269735	29
BRH1269736	13
BRH1269737	18
BRH1269739	18
BRH1269741	25
BRH1269746	4
BRH1269747	19
BRH1269748	2
BRH1269752	1
BRH1269753	2

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile
BRH1244900	3
BRH1244901	14
BRH1244902	2
BRH1244903	1
BRH1244904	1
BRH1244905	1
BRH1244906	15
BRH1244907	0
BRH1244908	5
BRH1244909	7
BRH1244910	6
BRH1244911	2
BRH1244912	4
BRH1244913	1
BRH1244914	11
BRH1244915	1
BRH1244916	8
BRH1244917	24
BRH1244918	4
BRH1244919	0
BRH1244920	5
BRH1244921	4
BRH1244922	33
BRH1244923	3
BRH1244924	1
BRH1244925	5
BRH1244926	19
BRH1244927	3
BRH1244928	9
BRH1244929	6
BRH1244930	1
BRH1244931	0
BRH1244932	15
BRH1244933	8
BRH1244934	13
BRH1244935	21
BRH1244936	5
BRH1244937	7
BRH1244938	14
BRH1244939	6
BRH1244940	2

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile
BRH1269755	19
BRH1269756	6
BRH1269758	24
DLS16-69619	1
DLS16-32252	13
160905AAC0014	37
160905AAC0015	9
160905AAC0016	5
160905AAC0005	8
160905AAC0006	4
160905AAC0007	53
160905AAC0009	24
160905AAC0010	2
160905AAC0011	1
160905AAC0002	5
160905AAC0004	2
BRH1274375	4
BRH1274376	6
BRH1274377	6
BRH1274379	2
BRH1274381	15
BRH1274382	2
BRH1274383	14
BRH1272211	6
BRH1272212	3
BRH1272214	11
BRH1272215	8
BRH1272216	2
BRH1272217	8
BRH1272219	26
BRH1272221	0
BRH1272222	50
BRH1272228	6
BRH1265976	1
BRH1265981	1
BRH1265984	10
BRH1265986	16
BRH1265989	37
BRH1265990	1
BRH1265991	8
BRH1265993	4

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile
BRH1244941	1
BRH1244942	10
BRH1244943	2
BRH1244944	38
BRH1244945	0
BRH1244946	12
BRH1244947	8
BRH1244948	6
BRH1244949	4
BRH1244950	2
BRH1244951	0
BRH1244952	2
BRH1244953	5
BRH1244954	0
BRH1244955	0
BRH1244956	43
BRH1244957	4
BRH1244958	4
BRH1244959	1
BRH1244960	1
BRH1244961	1
BRH1244962	2
BRH1244963	4
BRH1244964	8
BRH1244965	5
BRH1244966	2
BRH1244967	3
BRH1244968	0
BRH1244969	2
BRH1244970	9
BRH1244971	11
BRH1244972	1
BRH1244973	7
BRH1244974	1
BRH1244975	0
BRH1244976	4
BRH1244977	0
BRH1244978	0
BRH1244979	0
BRH1244980	0
BRH1244981	2

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile
BRH1265994	8
BRH1265996	20
BRH1265997	14
BRH1265998	3
BRH1265999	9
BRH1266000	12
BRH1269734	3
BRH1269738	2
BRH1269740	27
BRH1269742	13
BRH1269743	11
BRH1269744	4
BRH1269745	19
BRH1269749	0
BRH1269750	23
BRH1269751	8
BRH1269754	5
BRH1269757	3
DLS16-32288	8
DLS16-68885	13
DLS16-69258	3

No of Observations	103
Average Number	12.7
Median Number	8

# of Patients w/ 0 Pos Results	3
% Subjects w/ 0 pos results	2.9

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile
BRH1244982	0
BRH1244983	2
BRH1244984	3
BRH1244985	5
BRH1244986	0
BRH1244987	1
BRH1244988	11
BRH1244989	3
BRH1244990	2
BRH1244991	0
BRH1244992	1
BRH1267320	0
BRH1267321	15
BRH1267322	9
BRH1267323	0
BRH1244993	0
BRH1244994	0
BRH1244995	0
BRH1244996	2
BRH1244997	2
BRH1244998	5
BRH1244999	2
BRH1245000	8
BRH1245001	3
BRH1245002	4
BRH1245003	5
BRH1245004	1
BRH1245005	1
BRH1245006	0
BRH1245007	0
BRH1245008	16
BRH1245009	4
BRH1245010	11
BRH1245011	14
BRH1245012	1
BRH1245013	26
BRH1245014	0
BRH1245015	2
BRH1245016	17

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile
BRH1245017	0
BRH1245018	0
BRH1245019	6
BRH1245020	19
BRH1245021	1
BRH1245022	26
BRH1245023	3
BRH1245024	2
BRH1245025	11
BRH1245026	8
BRH1245027	20
BRH1245029	2
BRH1245030	5
BRH1245031	3
BRH1245032	0
BRH1245033	4
BRH1245034	6
BRH1245035	1
BRH1245036	17
BRH1245037	0
BRH1245038	4
BRH1245039	9
BRH1245040	4
BRH1245041	2
BRH1267327	5
BRH1267329	3
BRH1267330	2
BRH1267331	2
BRH1267333	2
BRH1267334	26
BRH1267335	11
BRH1267337	6
BRH1267338	0
BRH1267339	10
BRH1267340	18
BRH1267341	0
BRH1267342	2
BRH1267343	9
BRH1267345	0
BRH1267346	1
BRH1267347	1
BRH1267349	2

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 90th Percentile

No of Observations	163
Average Number	5.7
Median Number	3

# of Patients w/ 0 Pos Results	31
% Subjects w/ 0 pos results	19.0

Table 5A

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile
160905AAC0012	7
160905AAC0013	4
160905AAC0008	31
160905AAC0001	22
160905AAC0003	6
BRH1274374	4
BRH1274378	7
BRH1274380	2
BRH1272208	1
BRH1272209	23
BRH1272210	3
BRH1272213	28
BRH1272218	3
BRH1272220	17
BRH1272223	17
BRH1272224	5
BRH1272225	4
BRH1272226	26
BRH1272227	4
BRH1265975	25
BRH1265977	3
BRH1265978	4
BRH1265979	16
BRH1265980	0
BRH1265982	9
BRH1265983	5
BRH1265985	6
BRH1265987	6
BRH1265988	0
BRH1265992	0
BRH1265995	22
BRH1269735	19
BRH1269736	11
BRH1269737	8
BRH1269739	10
BRH1269741	16
BRH1269746	1
BRH1269747	8
BRH1269748	0
BRH1269752	0
BRH1269753	1

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile
BRH1244900	2
BRH1244901	5
BRH1244902	2
BRH1244903	0
BRH1244904	1
BRH1244905	0
BRH1244906	5
BRH1244907	0
BRH1244908	2
BRH1244909	5
BRH1244910	2
BRH1244911	0
BRH1244912	1
BRH1244913	0
BRH1244914	7
BRH1244915	0
BRH1244916	4
BRH1244917	16
BRH1244918	1
BRH1244919	0
BRH1244920	4
BRH1244921	2
BRH1244922	17
BRH1244923	2
BRH1244924	1
BRH1244925	1
BRH1244926	13
BRH1244927	2
BRH1244928	3
BRH1244929	2
BRH1244930	1
BRH1244931	0
BRH1244932	7
BRH1244933	2
BRH1244934	5
BRH1244935	11
BRH1244936	3
BRH1244937	3
BRH1244938	5
BRH1244939	2
BRH1244940	1

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile
BRH1269755	15
BRH1269756	3
BRH1269758	11
DLS16-69619	1
DLS16-32252	9
160905AAC0014	30
160905AAC0015	6
160905AAC0016	4
160905AAC0005	5
160905AAC0006	2
160905AAC0007	47
160905AAC0009	15
160905AAC0010	1
160905AAC0011	0
160905AAC0002	2
160905AAC0004	0
BRH1274375	2
BRH1274376	4
BRH1274377	3
BRH1274379	1
BRH1274381	8
BRH1274382	1
BRH1274383	9
BRH1272211	4
BRH1272212	1
BRH1272214	7
BRH1272215	6
BRH1272216	1
BRH1272217	6
BRH1272219	17
BRH1272221	0
BRH1272222	46
BRH1272228	1
BRH1265976	1
BRH1265981	1
BRH1265984	5
BRH1265986	9
BRH1265989	23
BRH1265990	0
BRH1265991	5
BRH1265993	1

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile
BRH1244941	1
BRH1244942	5
BRH1244943	1
BRH1244944	14
BRH1244945	0
BRH1244946	4
BRH1244947	3
BRH1244948	0
BRH1244949	3
BRH1244950	1
BRH1244951	0
BRH1244952	0
BRH1244953	1
BRH1244954	0
BRH1244955	0
BRH1244956	31
BRH1244957	3
BRH1244958	1
BRH1244959	0
BRH1244960	0
BRH1244961	1
BRH1244962	1
BRH1244963	1
BRH1244964	5
BRH1244965	2
BRH1244966	1
BRH1244967	1
BRH1244968	0
BRH1244969	1
BRH1244970	3
BRH1244971	4
BRH1244972	1
BRH1244973	3
BRH1244974	1
BRH1244975	0
BRH1244976	2
BRH1244977	0
BRH1244978	0
BRH1244979	0
BRH1244980	0
BRH1244981	1

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile
BRH1265994	3
BRH1265996	15
BRH1265997	11
BRH1265998	0
BRH1265999	7
BRH1266000	7
BRH1269734	0
BRH1269738	2
BRH1269740	19
BRH1269742	7
BRH1269743	8
BRH1269744	1
BRH1269745	15
BRH1269749	0
BRH1269750	18
BRH1269751	6
BRH1269754	1
BRH1269757	3
DLS16-32288	2
DLS16-68885	11
DLS16-69258	3

No of Observations	103
Average Number	8.1
Median Number	5

# of Patients w/ 0 Pos Results	12
% Subjects w/ 0 pos results	11.7

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile
BRH1244982	0
BRH1244983	2
BRH1244984	1
BRH1244985	2
BRH1244986	0
BRH1244987	0
BRH1244988	8
BRH1244989	1
BRH1244990	1
BRH1244991	1
BRH1244992	0
BRH1267320	0
BRH1267321	12
BRH1267322	3
BRH1267323	0
BRH1244993	0
BRH1244994	0
BRH1244995	0
BRH1244996	1
BRH1244997	1
BRH1244998	4
BRH1244999	1
BRH1245000	3
BRH1245001	0
BRH1245002	1
BRH1245003	1
BRH1245004	0
BRH1245005	1
BRH1245006	0
BRH1245007	0
BRH1245008	10
BRH1245009	3
BRH1245010	3
BRH1245011	10
BRH1245012	0
BRH1245013	10
BRH1245014	0
BRH1245015	2
BRH1245016	5

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile
BRH1245017	0
BRH1245018	0
BRH1245019	5
BRH1245020	13
BRH1245021	0
BRH1245022	15
BRH1245023	1
BRH1245024	1
BRH1245025	6
BRH1245026	5
BRH1245027	13
BRH1245029	1
BRH1245030	1
BRH1245031	3
BRH1245032	0
BRH1245033	1
BRH1245034	2
BRH1245035	0
BRH1245036	6
BRH1245037	0
BRH1245038	4
BRH1245039	6
BRH1245040	0
BRH1245041	0
BRH1267327	3
BRH1267329	2
BRH1267330	2
BRH1267331	1
BRH1267333	1
BRH1267334	13
BRH1267335	7
BRH1267337	4
BRH1267338	0
BRH1267339	3
BRH1267340	14
BRH1267341	0
BRH1267342	1
BRH1267343	6
BRH1267345	0
BRH1267346	0
BRH1267347	0
BRH1267349	2

ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile

NON-ULCERATIVE COLITIS POPULATION	
Sample ID	# of Positive Results Based on 95th Percentile

No of Observations	163
Average Number	2.9
Median Number	1

# of Patients w/ 0 Pos Results	50
% Subjects w/ 0 pos results	30.7

Table 5B

Summary statistics

Variable	Ulcerative_Colitis_90th_percentile Ulcerative Colitis 90th percentile
Sample size	103
Lowest value	0.0000
Highest value	53.0000
Arithmetic mean	12.7282
95% CI for the mean	10.3973 to 15.0590
Median	8.0000
95% CI for the median	7.0000 to 11.0000
Variance	142.2391
Standard deviation	11.9264
Relative standard deviation	0.9370 (93.70%)
Standard error of the mean	1.1751
Coefficient of Skewness	1.3143 (P<0.0001)
Coefficient of Kurtosis	1.2515 (P=0.0379)
D'Agostino-Pearson test for Normal distribution	reject Normality (P<0.0001)

Percentiles		95% Confidence interval
2.5	0.07500	
5	1.0000	0.0000 to 1.3540
10	1.8000	1.0000 to 2.0000
25	4.0000	2.0000 to 5.0730
75	19.0000	13.9270 to 25.0000
90	29.8000	25.0000 to 37.0000
95	37.0000	31.5842 to 50.5298
97.5	42.7750	

Table 6A

Summary statistics

Variable	Ulcerative_Colitis_95th_percentile Ulcerative Colitis 95th percentile
Sample size	103
Lowest value	0.0000
Highest value	47.0000
Arithmetic mean	8.1165
95% CI for the mean	6.2898 to 9.9432
Median	5.0000
95% CI for the median	4.0000 to 6.9228
Variance	87.3588
Standard deviation	9.3466
Relative standard deviation	1.1516 (115.16%)
Standard error of the mean	0.9209
Coefficient of Skewness	1.9463 (P<0.0001)
Coefficient of Kurtosis	4.4608 (P<0.0001)
D'Agostino-Pearson test for Normal distribution	reject Normality (P<0.0001)

Percentiles		95% Confidence interval
2.5	0.0000	
5	0.0000	0.0000 to 0.0000
10	0.0000	0.0000 to 1.0000
25	1.0000	1.0000 to 3.0000
75	11.0000	8.0000 to 16.0956
90	22.0000	16.8954 to 27.4692
95	26.7000	22.0000 to 46.1766
97.5	30.9250	

Table 6B

Summary statistics

Variable	Non_Ulcerative_Colitis_90th_percentile Non-Ulcerative Colitis 90th percentile

Sample size	163
Lowest value	0.0000
Highest value	43.0000
Arithmetic mean	5.6687
95% CI for the mean	4.5255 to 6.8119
Median	3.0000
95% CI for the median	2.0000 to 4.0000
Variance	54.6303
Standard deviation	7.3912
Relative standard deviation	1.3039 (130.39%)
Standard error of the mean	0.5789
Coefficient of Skewness	2.3467 (P<0.0001)
Coefficient of Kurtosis	6.6923 (P<0.0001)
D'Agostino-Pearson test for Normal distribution	reject Normality (P<0.0001)

Percentiles		95% Confidence interval
2.5	0.0000	0.0000 to 0.0000
5	0.0000	0.0000 to 0.0000
10	0.0000	0.0000 to 0.0000
25	1.0000	0.0000 to 1.0000
75	8.0000	5.6997 to 10.0000
90	15.0000	11.0000 to 19.2863
95	20.3500	16.5173 to 23.1987
97.5	26.0000	20.1327 to 41.9327

Table 7A

Summary statistics

Variable	Non_Ulcerative_Colitis_95th_percentile Non-Ulcerative Colitis 95th percentile

Sample size	163
Lowest value	0.0000
Highest value	31.0000
Arithmetic mean	2.8528
95% CI for the mean	2.1867 to 3.5189
Median	1.0000
95% CI for the median	1.0000 to 2.0000
Variance	18.5461
Standard deviation	4.3065
Relative standard deviation	1.5096 (150.96%)
Standard error of the mean	0.3373
Coefficient of Skewness	2.9508 (P<0.0001)
Coefficient of Kurtosis	12.1761 (P<0.0001)
D'Agostino-Pearson test for Normal distribution	reject Normality (P<0.0001)

Percentiles		95% Confidence interval
2.5	0.0000	0.0000 to 0.0000
5	0.0000	0.0000 to 0.0000
10	0.0000	0.0000 to 0.0000
25	0.0000	0.0000 to 1.0000
75	3.0000	3.0000 to 5.0000
90	7.2000	5.0000 to 13.0000
95	13.0000	10.0000 to 15.3141
97.5	14.4250	13.0000 to 28.0115

Table 7B

Summary statistics

Variable	Ulcerative_Colitis_90th_percentile_1
Back-transformed after logarithmic transformation.	
Sample size	103
Lowest value	0.1000
Highest value	53.0000
Geometric mean	7.3070
95% CI for the mean	5.7021 to 9.3637
Median	8.0000
95% CI for the median	7.0000 to 11.0000
Coefficient of Skewness	-1.1403 (P<0.0001)
Coefficient of Kurtosis	2.0327 (P=0.0056)
D'Agostino-Pearson test for Normal distribution	reject Normality (P<0.0001)

Percentiles		95% Confidence interval
2.5	0.1189	
5	1.0000	0.10000 to 1.2781
10	1.7411	1.0000 to 2.0000
25	4.0000	2.0000 to 5.0670
75	19.0000	13.9245 to 25.0000
90	29.7592	25.0000 to 37.0000
95	37.0000	31.5247 to 50.6003
97.5	42.7754	

Table 8A

Summary statistics

Variable	Ulcerative_Colitis_95th_percentile_1
Back-transformed after logarithmic transformation.	

Sample size	103
Lowest value	0.1000
Highest value	47.0000
Geometric mean	3.4690
95% CI for the mean	2.5190 to 4.7773
Median	5.0000
95% CI for the median	4.0000 to 6.9172
Coefficient of Skewness	-0.9013 (P=0.0005)
Coefficient of Kurtosis	0.1763 (P=0.5802)
D'Agostino-Pearson test for Normal distribution	reject Normality (P=0.0022)

Percentiles		95% Confidence interval
2.5	0.10000	
5	0.10000	0.10000 to 0.10000
10	0.10000	0.10000 to 1.0000
25	1.0000	1.0000 to 3.0000
75	11.0000	8.0000 to 16.0930
90	22.0000	16.8926 to 27.4547
95	26.6832	22.0000 to 46.1750
97.5	30.9316	

Table 8B

Summary statistics

Variable	Non_Ulcerative_Colitis_90th_percentile_1 Non-Ulcerative Colitis 90th percentile_1

Back-transformed after logarithmic transformation.

Sample size	163
Lowest value	0.1000
Highest value	43.0000
Geometric mean	2.1011
95% CI for the mean	1.6075 to 2.7463
Median	3.0000
95% CI for the median	2.0000 to 4.0000
Coefficient of Skewness	-0.6312 (P=0.0016)
Coefficient of Kurtosis	-0.6026 (P=0.0328)
D'Agostino-Pearson test for Normal distribution	reject Normality (P=0.0007)

Percentiles		95% Confidence interval
2.5	0.10000	0.10000 to 0.10000
5	0.10000	0.10000 to 0.10000
10	0.10000	0.10000 to 0.10000
25	1.0000	0.10000 to 1.0000
75	8.0000	5.6803 to 10.1000
90	15.0000	11.0000 to 19.3087
95	20.4105	16.5098 to 28.0218
97.5	26.0000	20.2171 to 41.8802

Table 9A

Summary statistics

Variable	Non_Ulcerative_Colitis_95th_percentile_1 Non-Ulcerative Colitis 95th percentile 1

Back-transformed after logarithmic transformation.

Sample size	163
Lowest value	0.1000
Highest value	31.0000
Geometric mean	0.9669
95% CI for the mean	0.7444 to 1.2559
Median	1.0000
95% CI for the median	1.0000 to 2.0000
Coefficient of Skewness	-0.1914 (P=0.3069)
Coefficient of Kurtosis	-1.2156 (P<0.0001)
D'Agostino-Pearson test for Normal distribution	reject Normality (P<0.0001)

Percentiles		95% Confidence interval
2.5	0.10000	0.10000 to 0.10000
5	0.10000	0.10000 to 0.10000
10	0.10000	0.10000 to 0.10000
25	0.10000	0.10000 to 1.0000
75	3.0000	3.0000 to 5.0000
90	7.1895	5.0000 to 13.0000
95	13.0000	10.1000 to 15.3072
97.5	14.4166	13.0000 to 27.2688

Table 9B

Independent samples t-test

Sample 1	
Variable	Non_Ulcerative_Colitis_90th_percentile_1 Non-Ulcerative Colitis 90th percentile_1
Sample 2	
Variable	Ulcerative_Colitis_90th_percentile_1

Back-transformed after logarithmic transformation.		
	Sample 1	Sample 2
Sample size	163	103
Geometric mean	2.1011	7.3070
95% CI for the mean	1.6075 to 2.7463	5.7021 to 9.3637
Variance of Logs	0.5654	0.3037
F-test for equal variances		P = 0.001

T-test (assuming equal variances)

Difference on Log-transformed scale	
Difference	0.5413
Standard Error	0.08577
95% CI of difference	0.3724 to 0.7102
Test statistic t	6.311
Degrees of Freedom (DF)	264
Two-tailed probability	P < 0.0001
Back-transformed results	
Ratio of geometric means	3.4776
95% CI of ratio	2.3573 to 5.1305

Table 10A

Independent samples t-test

Sample 1	
Variable	Non_Ulcerative_Colitis_95th_percentile_1 Non-Ulcerative Colitis 95th percentile_1
Sample 2	
Variable	Ulcerative_Colitis_____95th_percentile_1 Ulcerative Colitis 95th percentile_1

Back-transformed after logarithmic transformation.		
	Sample 1	Sample 2
Sample size	163	103
Geometric mean	0.9669	3.4690
95% CI for the mean	0.7444 to 1.2559	2.5190 to 4.7773
Variance of Logs	0.5391	0.5057
F-test for equal variances		P = 0.731

T-test (assuming equal variances)

Difference on Log-transformed scale	
Difference	0.5548
Standard Error	0.09131
95% CI of difference	0.3751 to 0.7346
Test statistic t	6.077
Degrees of Freedom (DF)	264
Two-tailed probability	P < 0.0001
Back-transformed results	
Ratio of geometric means	3.5879
95% CI of ratio	2.3717 to 5.4278

Table 10B

Mann-Whitney test (independent samples)

Sample 1	
Variable	Non_Ulcerative_Colitis_90th_percentile Non-Ulcerative Colitis 90th percentile
Sample 2	
Variable	Ulcerative_Colitis_90th_percentile Ulcerative Colitis 90th percentile

	Sample 1	Sample 2
Sample size	163	103
Lowest value	0.0000	0.0000
Highest value	43.0000	53.0000
Median	3.0000	8.0000
95% CI for the median	2.0000 to 4.0000	7.0000 to 11.0000
Interquartile range	1.0000 to 8.0000	4.0000 to 19.0000

Mann-Whitney test (independent samples)

Average rank of first group	110.8681
Average rank of second group	169.3155
Mann-Whitney U	4705.50
Test statistic Z (corrected for ties)	6.053
Two-tailed probability	P < 0.0001

Table 11A

Mann-Whitney test (independent samples)

Sample 1	
Variable	Non_Ulcerative_Colitis_95th_percentile Non-Ulcerative Colitis 95th percentile
Sample 2	
Variable	Ulcerative_Colitis_95th_percentile Ulcerative Colitis 95th percentile

	Sample 1	Sample 2
Sample size	163	103
Lowest value	0.0000	0.0000
Highest value	31.0000	47.0000
Median	1.0000	5.0000
95% CI for the median	1.0000 to 2.0000	4.0000 to 6.9228
Interquartile range	0.0000 to 3.0000	1.0000 to 11.0000

Mann-Whitney test (independent samples)

Average rank of first group	110.9939
Average rank of second group	169.1165
Mann-Whitney U	4726.00
Test statistic Z (corrected for ties)	6.068
Two-tailed probability	P < 0.0001

Table 11B

ROC curve

Variable	Ulcerative_Colitis_Test_90th Ulcerative Colitis Test_90th
Classification variable	Diagnosis__1_Ulcerative_Colitis_0_Non_Ulcerative_Colitis_ Diagnosis(1_Ulcerative Colitis 0_Non-Ulcerative Colitis)

Sample size	266
Positive group [a]	103 (38.72%)
Negative group [b]	163 (61.28%)

[a] Diagnosis__1_Ulcerative_Colitis_0_Non_Ulcerative_Colitis_ = 1
[b] Diagnosis__1_Ulcerative_Colitis_0_Non_Ulcerative_Colitis_ = 0

Disease prevalence (%)	unknown

Area under the ROC curve (AUC)

Area under the ROC curve (AUC)	0.720
Standard Error [a]	0.0315
95% Confidence interval [b]	0.662 to 0.773
z statistic	6.966
Significance level P (Area=0.5)	<0.0001

[a] DeLong et al., 1988
[b] Binomial exact

Youden index

Youden index J	0.3412
95% Confidence interval [a]	0.2311 to 0.4414
Associated criterion	>5
95% Confidence interval [a]	>2 to >9
Sensitivity	66.02
Specificity	68.10

[a] BC_a bootstrap confidence interval (1000 iterations; random number seed: 978).

Table 12A

ROC curve

Variable	Ulcerative_Colitis_Test_95th Ulcerative Colitis Test_95th
Classification variable	Diagnosis__1_Ulcerative_Colitis_0_Non_Ulcerative_Colitis_ Diagnosis(1_Ulcerative Colitis 0_Non-Ulcerative Colitis)

Sample size	266
Positive group [a]	103 (38.72%)
Negative group [b]	163 (61.28%)

[a] Diagnosis__1_Ulcerative_Colitis_0_Non_Ulcerative_Colitis_ = 1
[b] Diagnosis__1_Ulcerative_Colitis_0_Non_Ulcerative_Colitis_ = 0

Disease prevalence (%)	unknown

Area under the ROC curve (AUC)

Area under the ROC curve (AUC)	0.719
Standard Error [a]	0.0325
95% Confidence interval [b]	0.660 to 0.772
z statistic	6.715
Significance level P (Area=0.5)	<0.0001

[a] DeLong et al., 1988
[b] Binomial exact

Youden index

Youden index J	0.3565
95% Confidence interval [a]	0.2058 to 0.4465
Associated criterion	>3
95% Confidence interval [a]	>2 to >5
Sensitivity	60.19
Specificity	75.46

[a] BC_a bootstrap confidence interval (1000 iterations; random number seed: 978).

Table 12B

Performance Metrics in Predicting Ulcerative Colitis Status from Number of Positive Foods

Using 90th Percentile of ELISA Signal to determine Positive

Sex	No. of Positive Foods as Cutoff	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Overall Percent Agreement
FEMALE	1	0.97	0.14	0.49	0.83	0.52
	2	0.92	0.29	0.52	0.80	0.58
	3	0.85	0.40	0.55	0.75	0.61
	4	0.76	0.49	0.56	0.71	0.62
	5	0.69	0.57	0.58	0.68	0.62
	6	0.62	0.62	0.58	0.65	0.62
	7	0.55	0.66	0.58	0.63	0.61
	8	0.49	0.69	0.57	0.61	0.60
	9	0.44	0.72	0.57	0.60	0.59
	10	0.39	0.75	0.58	0.59	0.58
	11	0.34	0.78	0.58	0.58	0.58
	12	0.31	0.81	0.59	0.58	0.58
	13	0.28	0.83	0.59	0.57	0.58
	14	0.25	0.84	0.58	0.56	0.57
	15	0.23	0.85	0.57	0.56	0.56
	16	0.21	0.86	0.57	0.56	0.56
	17	0.20	0.87	0.57	0.56	0.56
	18	0.19	0.88	0.58	0.56	0.56
	19	0.18	0.90	0.60	0.56	0.56
	20	0.17	0.91	0.63	0.56	0.57
	21	0.16	0.93	0.64	0.56	0.57
	22	0.15	0.93	0.67	0.56	0.57
	23	0.15	0.95	0.67	0.56	0.57
	24	0.14	0.95	0.71	0.56	0.57
	25	0.13	0.95	0.71	0.56	0.57
	26	0.11	0.96	0.71	0.56	0.57
	27	0.11	0.97	0.75	0.56	0.57
	28	0.09	0.98	0.75	0.55	0.57
	29	0.08	0.98	0.80	0.55	0.57
	30	0.08	1.00	1.00	0.55	0.57
	31	0.08	1.00	1.00	0.55	0.57
	32	0.07	1.00	1.00	0.55	0.57

Sex	No. of Positive Foods as Cutoff	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Overall Percent Agreement
	33	0.07	1.00	1.00	0.55	0.57
	34	0.06	1.00	1.00	0.55	0.56
	35	0.06	1.00	1.00	0.55	0.56
	36	0.06	1.00	1.00	0.55	0.56
	37	0.05	1.00	1.00	0.55	0.56
	38	0.05	1.00	1.00	0.55	0.56
	39	0.05	1.00	1.00	0.55	0.56
	40	0.03	1.00	1.00	0.55	0.55
	41	0.03	1.00	1.00	0.54	0.55
	42	0.03	1.00	1.00	0.54	0.55
	43	0.03	1.00	1.00	0.54	0.55
	44	0.03	1.00	1.00	0.54	0.55
	45	0.03	1.00	1.00	0.54	0.55
	46	0.03	1.00	1.00	0.54	0.55
	47	0.03	1.00	1.00	0.54	0.55
	48	0.03	1.00	1.00	0.54	0.55
	49	0.03	1.00	1.00	0.54	0.55
	50	0.03	1.00	1.00	0.54	0.55
	51	0.03	1.00	1.00	0.54	0.55
	52	0.03	1.00	1.00	0.54	0.54
	53	0.02	1.00	1.00	0.54	0.54
	54	0.00	1.00	1.00	0.54	0.54
	55	0.00	1.00	1.00	0.54	0.54
	56	0.00	1.00	1.00	0.54	0.54
	57	0.00	1.00	.	0.53	0.53
	58	0.00	1.00	.	0.53	0.53

Table 13A

Performance Metrics in Predicting Ulcerative Colitis Status from Number of Positive Foods Using 90th Percentile of ELISA Signal to determine Positive

Sex	No. of Positive Foods as Cutoff	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Overall Percent Agreement
MALE	1	0.97	0.15	0.35	0.90	0.41
	2	0.94	0.29	0.38	0.91	0.49
	3	0.88	0.42	0.42	0.88	0.57
	4	0.84	0.50	0.45	0.87	0.61
	5	0.81	0.56	0.47	0.86	0.64
	6	0.77	0.63	0.49	0.85	0.67
	7	0.72	0.68	0.51	0.84	0.69
	8	0.67	0.72	0.53	0.82	0.71
	9	0.64	0.76	0.56	0.81	0.72
	10	0.59	0.79	0.57	0.80	0.73
	11	0.56	0.82	0.59	0.80	0.73
	12	0.54	0.84	0.62	0.79	0.74
	13	0.52	0.86	0.64	0.79	0.75
	14	0.50	0.87	0.65	0.78	0.75
	15	0.46	0.89	0.67	0.78	0.75
	16	0.44	0.90	0.68	0.77	0.75
	17	0.42	0.92	0.71	0.77	0.76
	18	0.39	0.93	0.71	0.76	0.76
	19	0.38	0.93	0.71	0.76	0.75
	20	0.36	0.94	0.73	0.75	0.75
	21	0.34	0.94	0.73	0.75	0.75
	22	0.32	0.95	0.73	0.75	0.75
	23	0.31	0.95	0.75	0.74	0.75
	24	0.30	0.95	0.75	0.74	0.74
	25	0.28	0.95	0.75	0.74	0.74
	26	0.27	0.96	0.75	0.73	0.73
	27	0.23	0.96	0.75	0.73	0.73
	28	0.21	0.97	0.73	0.72	0.72
	29	0.18	0.97	0.71	0.71	0.71

Sex	No. of Positive Foods as Cutoff	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Overall Percent Agreement
	30	0.16	0.97	0.70	0.71	0.71
	31	0.14	0.97	0.67	0.71	0.71
	32	0.13	0.97	0.67	0.70	0.70
	33	0.12	0.97	0.67	0.70	0.70
	34	0.11	0.97	0.67	0.70	0.70
	35	0.10	0.98	0.67	0.70	0.70
	36	0.08	0.98	0.67	0.69	0.69
	37	0.07	0.98	0.67	0.69	0.69
	38	0.06	0.98	0.50	0.69	0.68
	39	0.04	0.98	0.50	0.69	0.68
	40	0.03	0.98	0.50	0.68	0.68
	41	0.03	0.98	0.50	0.68	0.68
	42	0.00	0.98	0.00	0.68	0.68
	43	0.00	0.98	0.00	0.68	0.67
	44	0.00	0.98	0.00	0.68	0.67
	45	0.00	0.99	0.00	0.68	0.67
	46	0.00	1.00	0.00	0.68	0.67
	47	0.00	1.00	0.00	0.68	0.67
	48	0.00	1.00	0.00	0.68	0.67
	49	0.00	1.00	0.00	0.68	0.68
	50	0.00	1.00	0.00	0.68	0.68
	51	0.00	1.00	0.00	0.68	0.68
	52	0.00	1.00	0.00	0.68	0.68
	53	0.00	1.00	0.00	0.68	0.68
	54	0.00	1.00	0.00	0.68	0.68
	55	0.00	1.00	0.00	0.68	0.68
	56	0.00	1.00	.	0.68	0.68
	57	0.00	1.00	.	0.68	0.68
	58	0.00	1.00	.	0.68	0.68

Table 13B

Performance Metrics in Predicting Ulcerative Colitis Status from Number of Positive Foods

Using 95th Percentile of ELISA Signal to determine Positive

Sex	*No. of Positive Foods as Cutoff*	*Sensitivity*	*Specificity*	*Positive Predictive Value*	*Negative Predictive Value*	*Overall Percent Agreement*
FEMALE	1	0.89	0.27	0.51	0.74	0.56
	2	0.75	0.45	0.54	0.68	0.59
	3	0.65	0.58	0.57	0.66	0.61
	4	0.55	0.65	0.58	0.63	0.61
	5	0.49	0.72	0.60	0.62	0.62
	6	0.44	0.76	0.61	0.61	0.61
	7	0.38	0.80	0.63	0.60	0.61
	8	0.33	0.83	0.63	0.59	0.60
	9	0.29	0.85	0.63	0.58	0.59
	10	0.25	0.87	0.63	0.57	0.58
	11	0.22	0.88	0.62	0.57	0.58
	12	0.19	0.90	0.63	0.56	0.57
	13	0.18	0.91	0.64	0.56	0.57
	14	0.18	0.93	0.67	0.56	0.58
	15	0.17	0.94	0.70	0.57	0.58
	16	0.15	0.95	0.75	0.57	0.58
	17	0.14	0.97	0.80	0.57	0.58
	18	0.13	0.98	0.83	0.56	0.58
	19	0.11	0.98	0.88	0.56	0.58
	20	0.11	1.00	1.00	0.56	0.58
	21	0.09	1.00	1.00	0.56	0.58
	22	0.08	1.00	1.00	0.56	0.57
	23	0.08	1.00	1.00	0.55	0.57
	24	0.06	1.00	1.00	0.55	0.57
	25	0.06	1.00	1.00	0.55	0.56
	26	0.06	1.00	1.00	0.55	0.56
	27	0.06	1.00	1.00	0.55	0.56
	28	0.06	1.00	1.00	0.55	0.56
	29	0.05	1.00	1.00	0.55	0.56
	30	0.05	1.00	1.00	0.55	0.56

Sex	No. of Positive Foods as Cutoff	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Overall Percent Agreement
	31	0.05	1.00	1.00	0.55	0.56
	32	0.05	1.00	1.00	0.55	0.56
	33	0.03	1.00	1.00	0.55	0.55
	34	0.03	1.00	1.00	0.54	0.55
	35	0.03	1.00	1.00	0.54	0.55
	36	0.03	1.00	1.00	0.54	0.55
	37	0.03	1.00	1.00	0.54	0.55
	38	0.03	1.00	1.00	0.54	0.55
	39	0.03	1.00	1.00	0.54	0.55
	40	0.03	1.00	1.00	0.54	0.55
	41	0.03	1.00	1.00	0.54	0.55
	42	0.03	1.00	1.00	0.54	0.55
	43	0.03	1.00	1.00	0.54	0.55
	44	0.03	1.00	1.00	0.54	0.55
	45	0.03	1.00	1.00	0.54	0.55
	46	0.03	1.00	1.00	0.54	0.55
	47	0.03	1.00	1.00	0.54	0.54
	48	0.00	1.00	1.00	0.54	0.54
	49	0.00	1.00	1.00	0.54	0.54
	50	0.00	1.00	1.00	0.54	0.54
	51	0.00	1.00	1.00	0.54	0.54
	52	0.00	1.00	1.00	0.54	0.54
	53	0.00	1.00	1.00	0.53	0.53
	54	0.00	1.00	1.00	0.53	0.53
	55	0.00	1.00	1.00	0.53	0.53
	56	0.00	1.00	.	0.53	0.53
	57	0.00	1.00	.	0.53	0.53
	58	0.00	1.00	.	0.53	0.53

Table 14A

Performance Metrics in Predicting Ulcerative Colitis Status from Number of Positive Foods

Using 95th Percentile of ELISA Signal to determine Positive

Sex	No. of Positive Foods as Cutoff	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Overall Percent Agreement
MALE	1	0.90	0.25	0.36	0.85	0.46
	2	0.83	0.48	0.43	0.86	0.59
	3	0.79	0.64	0.51	0.87	0.69
	4	0.74	0.72	0.55	0.85	0.72
	5	0.64	0.78	0.58	0.82	0.73
	6	0.58	0.83	0.62	0.80	0.75
	7	0.53	0.87	0.65	0.79	0.76
	8	0.48	0.89	0.67	0.78	0.76
	9	0.44	0.91	0.69	0.77	0.76
	10	0.40	0.92	0.69	0.76	0.75
	11	0.36	0.92	0.69	0.75	0.74
	12	0.33	0.93	0.69	0.75	0.74
	13	0.31	0.93	0.69	0.74	0.73
	14	0.30	0.94	0.70	0.74	0.73
	15	0.28	0.95	0.73	0.74	0.73
	16	0.27	0.95	0.73	0.73	0.73
	17	0.24	0.96	0.75	0.73	0.73
	18	0.22	0.97	0.75	0.72	0.73
	19	0.20	0.97	0.75	0.72	0.72
	20	0.19	0.97	0.75	0.72	0.72
	21	0.17	0.97	0.75	0.71	0.72
	22	0.14	0.98	0.75	0.71	0.71
	23	0.12	0.98	0.75	0.70	0.70
	24	0.10	0.98	0.67	0.70	0.70
	25	0.08	0.98	0.67	0.69	0.70
	26	0.07	0.98	0.67	0.69	0.69
	27	0.06	0.98	0.67	0.69	0.69
	28	0.04	0.98	0.67	0.69	0.69
	29	0.04	0.98	0.50	0.69	0.68
	30	0.03	0.98	0.50	0.68	0.68

Sex	No. of Positive Foods as Cutoff	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Overall Percent Agreement
	31	0.03	0.98	0.50	0.68	0.68
	32	0.00	0.99	0.50	0.68	0.68
	33	0.00	1.00	0.00	0.68	0.68
	34	0.00	1.00	0.00	0.68	0.68
	35	0.00	1.00	0.00	0.68	0.67
	36	0.00	1.00	0.00	0.68	0.67
	37	0.00	1.00	0.00	0.68	0.68
	38	0.00	1.00	0.00	0.68	0.68
	39	0.00	1.00	0.00	0.68	0.68
	40	0.00	1.00	0.00	0.68	0.68
	41	0.00	1.00	0.00	0.68	0.68
	42	0.00	1.00	0.00	0.68	0.68
	43	0.00	1.00	0.00	0.68	0.68
	44	0.00	1.00	0.00	0.68	0.68
	45	0.00	1.00	0.00	0.68	0.68
	46	0.00	1.00	.	0.68	0.68
	47	0.00	1.00	.	0.68	0.68
	48	0.00	1.00	.	0.68	0.68
	49	0.00	1.00	.	0.68	0.68
	50	0.00	1.00	.	0.68	0.68
	51	0.00	1.00	.	0.68	0.68
	52	0.00	1.00	.	0.68	0.68
	53	0.00	1.00	.	0.68	0.68
	54	0.00	1.00	.	0.68	0.68
	55	0.00	1.00	.	0.68	0.68
	56	0.00	1.00	.	0.68	0.68
	57	0.00	1.00	.	0.68	0.68
	58	0.00	1.00	.	0.68	0.68

Table 14B

CLAIMS

What is claimed is:

1. A test kit with for testing food intolerance in patients diagnosed with or suspected to have Ulcerative Colitis, comprising:

   one or more distinct food preparations, wherein each food preparation is independently coupled to an individually addressable solid carrier;

   wherein each distinct food preparation has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value, or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value, wherein the average discriminatory p-value is determined by a process comprising comparing assay values of a first patient test cohort that is diagnosed with or suspected of having Ulcerative Colitis with assay values of a second patient test cohort that is not diagnosed with or suspected of having Ulcerative Colitis.

2. The test kit of claim 1 wherein the plurality of food preparations includes at least two food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

3. The test kit of claim 1 wherein the plurality of food preparations includes at least four food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

4. The test kit of claim 1 wherein the plurality of food preparations includes at least eight food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

5. The test kit of claim 1 wherein the plurality of food preparations includes at least 12 food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

6. The test kit of claim 1 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value.

7. The test kit of any one of claims 1-5 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an

average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value.

8. The test kit of claim 1 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value.

9. The test kit of any one of claims 1-5 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value.

10. The test kit of claim 1 wherein FDR multiplicity adjusted p-value is adjusted for at least one of age and gender.

11. The test kit of any one of claims 1-8 wherein FDR multiplicity adjusted p-value is adjusted for at least one of age and gender.

12. The test kit of claim 1 wherein FDR multiplicity adjusted p-value is adjusted for age and gender.

13. The test kit of any one of claims 1-8 wherein FDR multiplicity adjusted p-value is adjusted for age and gender.

14. The test kit of claim 1 wherein at least 50% of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

15. The test kit of any one of claims 1-13 wherein at least 50% of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

16. The test kit of claim 1 wherein at least 70% of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as

determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

17. The test kit of any one of the claims 1-13 wherein at least 70% of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

18. The test kit of claim 1 wherein all of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

19. The test kit of any one of the claims 1-17 wherein all of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

20. The test kit of claim 1 wherein the plurality of distinct food preparations is crude filtered aqueous extracts.

21. The test kit of any one of the claims 1-19 wherein the plurality of distinct food preparations is crude filtered aqueous extracts.

22. The test kit of claim 1 wherein the plurality of distinct food preparations is processed aqueous extracts.

23. The test kit of any one of the claims 1-21 wherein the plurality of distinct food preparations is processed aqueous extracts.

24. The test kit of claim 1 wherein the solid carrier is a well of a multiwall plate, a bead, an electrical, a chemical sensor, a microchip or an adsorptive film.

25. The test kit of any one of the claims 1-23 wherein the solid carrier is a well of a multiwall plate, a bead, an electrical, a chemical sensor, a microchip or an adsorptive film.

26. A method of testing food intolerance in patients diagnosed with or suspected to have Ulcerative Colitis, comprising:

contacting a food preparation with a bodily fluid of a patient that is diagnosed with or suspected to have Ulcerative Colitis, and wherein the bodily fluid is associated with a gender identification;

wherein the step of contacting is performed under conditions that allow IgG from the bodily fluid to bind to at least one component of the food preparation;

measuring IgG bound to the at least one component of the food preparation to obtain a signal;

comparing the signal to a gender-stratified reference value for the food preparation using the gender identification to obtain a result; and

updating or generating a report using the result.

27. The method of claim 26 wherein the bodily fluid of the patient is whole blood, plasma, serum, saliva, or a fecal suspension.

28. The method of claim 26 wherein the step of contacting a food preparation is performed with a plurality of distinct food preparations.

29. The method of claim 26 or claim 27 wherein the step of contacting a food preparation is performed with a plurality of distinct food preparations.

30. The method of claim 28 wherein the plurality of distinct food preparations is prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

31. The method of any of the claims 28-29 wherein the plurality of distinct food preparations is prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

32. The method of claim 28 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

33. The method of any of the claims 28-29 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

34. The method of claim 28 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value.

35. The method of any of the claims 28-29 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value.

36. The method of claim 28 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value.

37. The method of any of the claims 28-29 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value.

38. The method of claim 28 wherein all of the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

39. The method of any of the claims 28-29 wherein all of the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

40. The method of claim 26 wherein the food preparation is immobilized on a solid surface, optionally in an addressable manner.

41. The method of any of the claims 26-39 wherein the food preparation is immobilized on a solid surface, optionally in an addressable manner.

42. The method of claim 26 wherein the step of measuring IgG bound to the at least one component of the food preparation is performed via an immunoassay test.

43. The method of any of the claims 26-41 wherein the step of measuring IgG bound to the at least one component of the food preparation is performed via immunoassay test.

44. The method of claim 26 wherein the gender-stratified reference value for the food preparation is an at least a 90^{th} percentile value.

45. The method of any of the claims 26-43 wherein the gender-stratified reference value for the food preparation is an at least a 90^{th} percentile value.

46. A method of generating a test for food intolerance in patients diagnosed with or suspected to have Ulcerative Colitis, comprising:

obtaining test results for a plurality of distinct food preparations, wherein the test results are based on bodily fluids of patients diagnosed with or suspected to have Ulcerative Colitis and bodily fluids of a control group not diagnosed with or not suspected to have Ulcerative Colitis;

stratifying the test results by gender for each of the distinct food preparations; and

assigning for a predetermined percentile rank a different cutoff value for male and female patients for each of the distinct food preparations.

47. The method of claim 46 wherein the test result is an ELISA result.

48. The method of claim 46 wherein the plurality of distinct food preparations includes at least two food preparations prepared from food items of Table 1 or selected foods 1-58 of Table 2.

49. The method of claim 46 or claim 47 wherein the plurality of distinct food preparations includes at least two food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

50. The method of claim 46 wherein the plurality of distinct food preparations includes at least six food preparations prepared from food items of Table 1 or selected from a group consisting of foods 1-58 of Table 2.

51. The method of any of claim 46 or claim 47 wherein the plurality of distinct food preparations includes at least six food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

52. The method of claim 46 wherein the plurality of distinct food preparations includes a food preparation prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

53. The method of any of claim 46 or 47 wherein the plurality of distinct food preparations includes a food preparation prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

54. The method of claim 46 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

55. The method of any of claims 46-53 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

56. The method of claim 46 wherein the plurality of different food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value.

57. The method of any of claims 46-53 wherein the plurality of different food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value.

58. The method of claim 46 wherein the plurality of different food preparations has an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value.

59. The method of any of claims 46-53 wherein the plurality of different food preparations has an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value.

60. The method of claim 46 wherein the bodily fluid of the patient is whole blood, plasma, serum, saliva, or a fecal suspension.

61. The method of any of claims 46-59 wherein the bodily fluid of the patient is whole blood, plasma, serum, saliva, or a fecal suspension.

62. The method of claim 46 wherein the predetermined percentile rank is an at least 90^{th} percentile rank.

63. The method of any of claims 46-61 wherein the predetermined percentile rank is an at least 90^{th} percentile rank.

64. The method of claim 46 wherein the cutoff value for male and female patients has a difference of at least 10% (abs).

65. The method of any of claims 46-63 wherein the cutoff value for male and female patients has a difference of at least 10% (abs).

66. The method of claim 26 or 46, further comprising a step of normalizing the result to the patient's total IgG.

67. The method of any of claims 26-65, further comprising a step of normalizing the result to the patient's total IgG.

68. The method of claim 26 or 46, further comprising a step of normalizing the result to the global mean of the patient's food specific IgG results.

69. The method of any of claims 26-65, further comprising a step of normalizing the result to the global mean of the patient's food specific IgG results.

70. The method of claim 26 or 46, further comprising a step of identifying a subset of patients, wherein the subset of patients' sensitivities to the food preparations underlies Ulcerative Colitis by raw p-value or an average discriminatory p-value of ≤ 0.01.

71. The method of any of claims 26-65, further comprising a step of identifying a subset of patients, wherein the subset of patients' sensitivities to the food preparations underlies Ulcerative Colitis by raw p-value or an average discriminatory p-value of ≤ 0.01.

72. The method of claim 26 or 46, further comprising a step of determining numbers of the food preparations, wherein the numbers of the food preparations can be used to confirm Ulcerative Colitis by raw p-value or an average discriminatory p-value of ≤ 0.01.

73. The method of any of claims 26-65, further comprising a step of determining numbers of the food preparations, wherein the numbers of the food preparations can be used to confirm Ulcerative Colitis by raw p-value or an average discriminatory p-value of ≤ 0.01.

74. Use of a plurality of distinct food preparations coupled to individually addressable respective solid carriers in a diagnosis of Ulcerative Colitis, wherein the plurality of distinct food preparations have an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

75. Use of claim 74 wherein the plurality of food preparations includes at least two food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

76. Use of claim 74 wherein the plurality of food preparations includes at least four food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

77. Use of claim 74 wherein the plurality of food preparations includes at least eight food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

78. Use of claim 74 wherein the plurality of food preparations includes at least 12 food preparations prepared from food items of Table 1 or selected from foods 1-58 of Table 2.

79. Use of claim 74 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value.

80. Use of any one of claims 74-78, wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.05 as determined by raw p-value or an average discriminatory p-value of ≤ 0.08 as determined by FDR multiplicity adjusted p-value.

81. Use of claim of claim 74 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value.

82. Use of any one of claims 74-78 wherein the plurality of distinct food preparations has an average discriminatory p-value of ≤ 0.025 as determined by raw p-value or an average discriminatory p-value of ≤ 0.07 as determined by FDR multiplicity adjusted p-value.

83. Use of claim 74 wherein FDR multiplicity adjusted p-value is adjusted for at least one of age and gender.

84. Use of any one of claims 74-82 wherein FDR multiplicity adjusted p-value is adjusted for at least one of age and gender.

85. Use of claim 74 wherein FDR multiplicity adjusted p-value is adjusted for age and gender.

86. Use of any one of claims 74-82 wherein FDR multiplicity adjusted p-value is adjusted for age and gender.

87. Use of claim 74 wherein at least 50% of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

88. Use of any one of claims 74-86 wherein at least 50% of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

89. Use of claim 74 wherein at least 70% of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

90. Use of any one of the claims 74-86 wherein at least 70% of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

91. Use of claim 74 wherein all of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

92. Use of any one of the claims 74-86 wherein all of the plurality of distinct food preparations, when adjusted for a single gender, has an average discriminatory p-value of ≤ 0.07 as determined by raw p-value or an average discriminatory p-value of ≤ 0.10 as determined by FDR multiplicity adjusted p-value.

93. Use of claim 74 wherein the plurality of distinct food preparations is crude filtered aqueous extracts.

94. Use of any one of the claims 74-92 wherein the plurality of distinct food preparations is crude filtered aqueous extracts.

95. Use of claim 74 wherein the plurality of distinct food preparations is processed aqueous extracts.

96. Use of any one of the claims 74-94 wherein the plurality of distinct food preparations is processed aqueous extracts.

97. Use of claim 74 wherein the solid carrier is a well of a multiwall plate, a bead, an electrical sensor, a chemical sensor, a microchip, or an adsorptive film.

98. Use of any one of the claims 74-96 wherein the solid carrier is a well of a multiwall plate, a bead, an electrical sensor, a chemical sensor, a microchip, or an adsorptive film.

99. Use of any one of claims 74-96, wherein the average discriminatory p-value is determined by a process comprising comparing assay values of a first patient test cohort that is diagnosed with or suspected of having Ulcerative Colitis headaches with assay values of a second patient test cohort that is not diagnosed with or suspected of having Ulcerative Colitis headaches.

100. The method of claim 46, wherein the test result is an ELISA result derived from a process that includes separately contacting each distinct food preparation with the bodily fluid of each patient.

Distribution of ELISA Signal Scores by Diagnosis
Sex=MALE Food=Green Pea

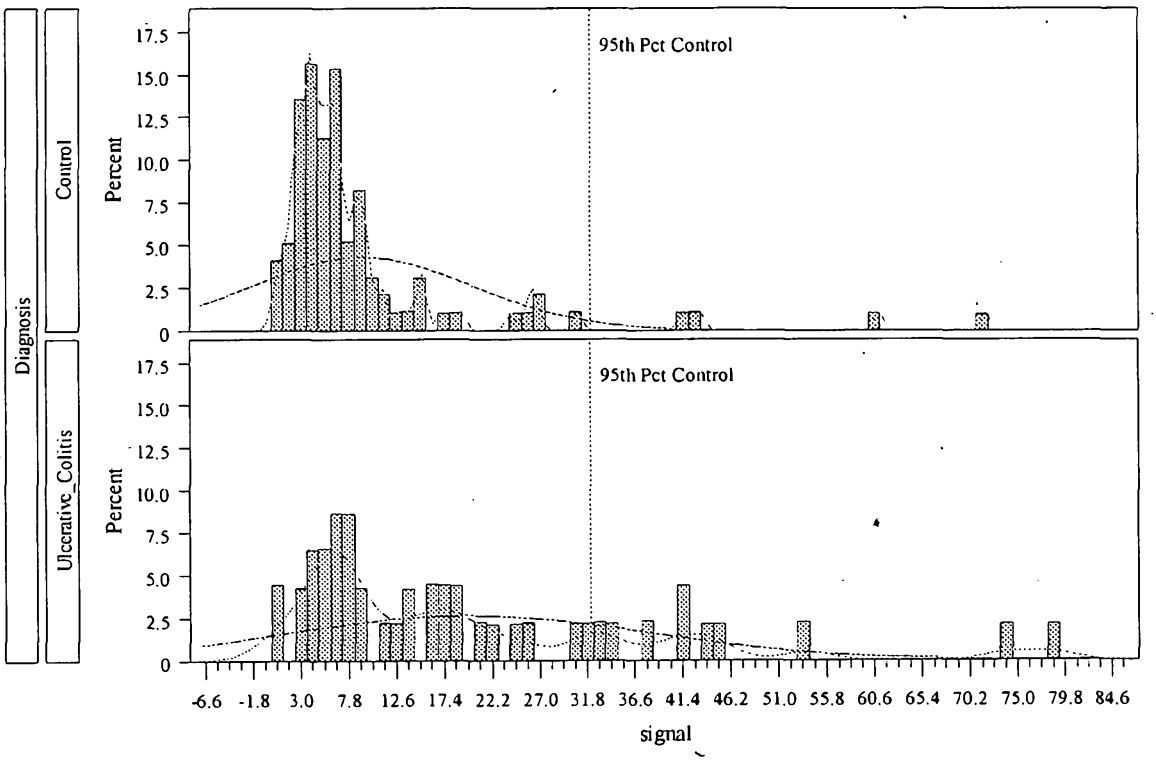

Figure 1A

Distribution of Percentage of Ulcerative Colitis Subjects with Signals >= Control Cutpoint across 1000 Bootstrapped Samples

Sex=MALE Food=Green Pea

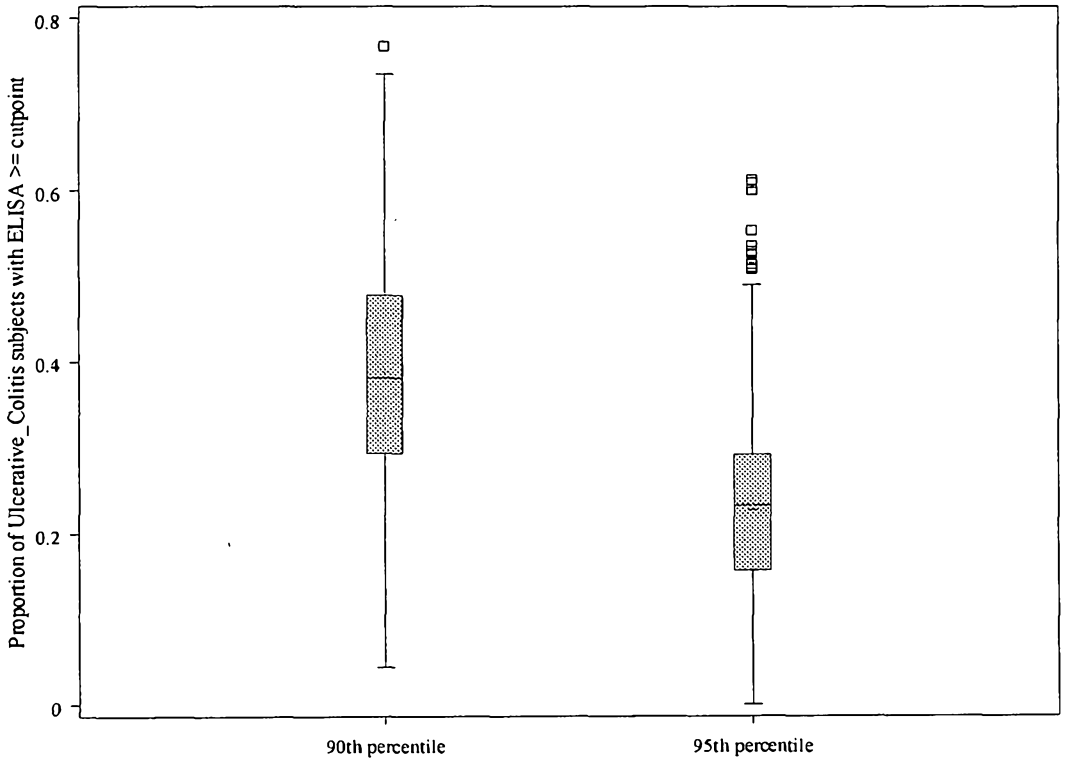

Figure 1B

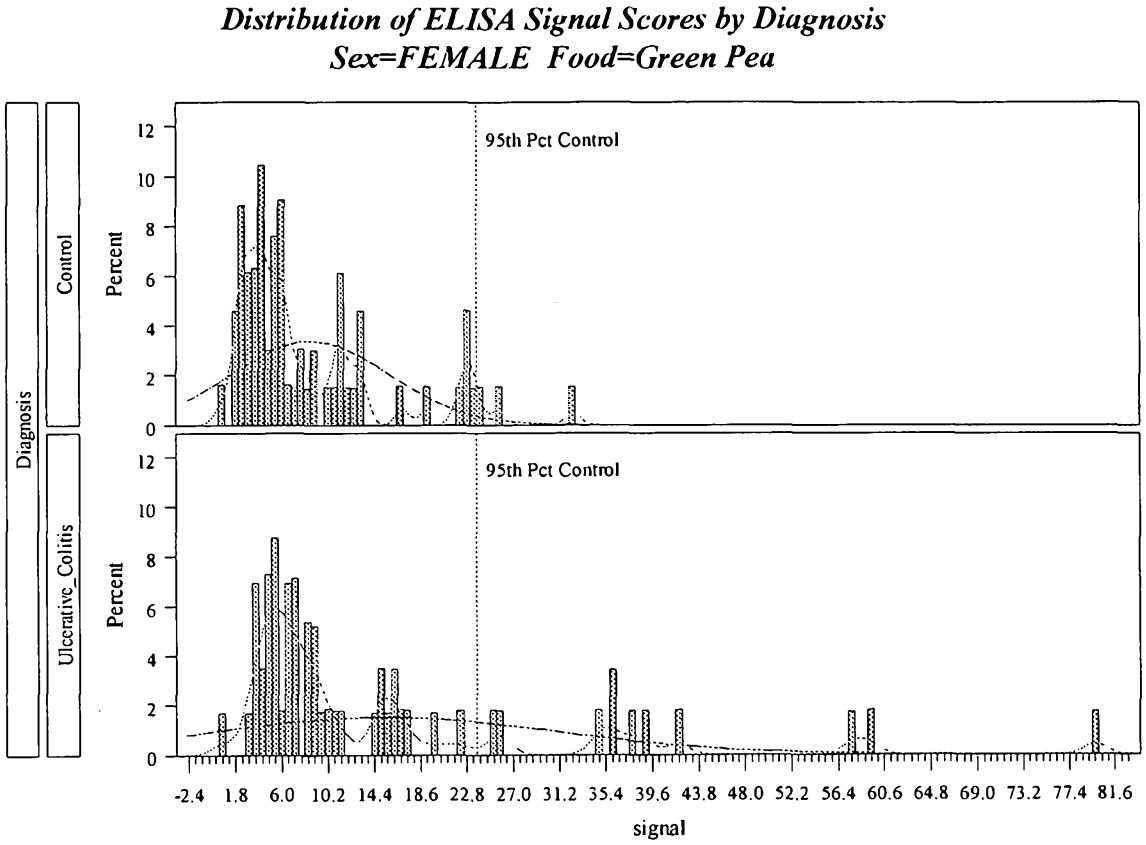
Distribution of ELISA Signal Scores by Diagnosis
Sex=FEMALE Food=Green Pea
Diagnosis
Control
Ulcerative_Colitis
Percent
95th Pct Control
95th Pct Control
0
2
4
6
8
10
12
-2.4 1.8 6.0 10.2 14.4 18.6 22.8 27.0 31.2 35.4 39.6 43.8 48.0 52.2 56.4 60.6 64.8 69.0 73.2 77.4 81.6
signal

Figure 1C

Distribution of Percentage of Ulcerative Colitis Subjects with Signals >= Control Cutpoint across 1000 Bootstrapped Samples

Sex=FEMALE Food=Green Pea

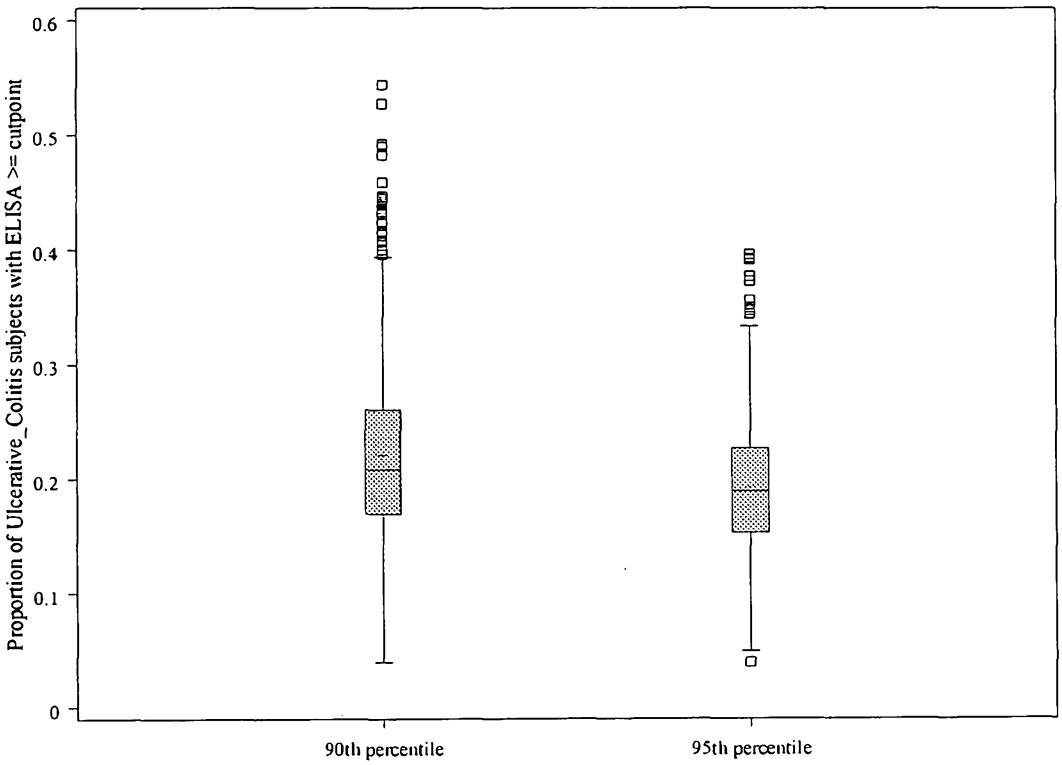

Figure 1D

Distribution of ELISA Signal Scores by Diagnosis

Sex=MALE Food=Cantaloupe

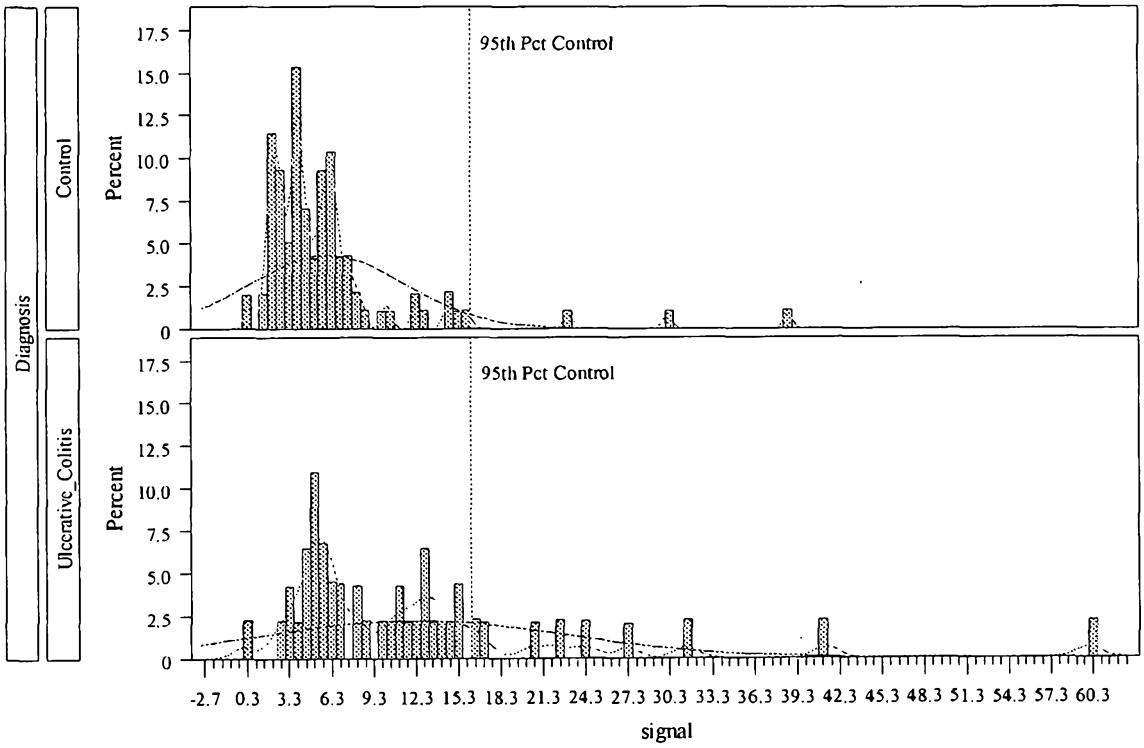

Figure 2A

Distribution of Percentage of Ulcerative Colitis Subjects with Signals >= Control Cutpoint across 1000 Bootstrapped Samples

Sex=MALE Food=Cantaloupe

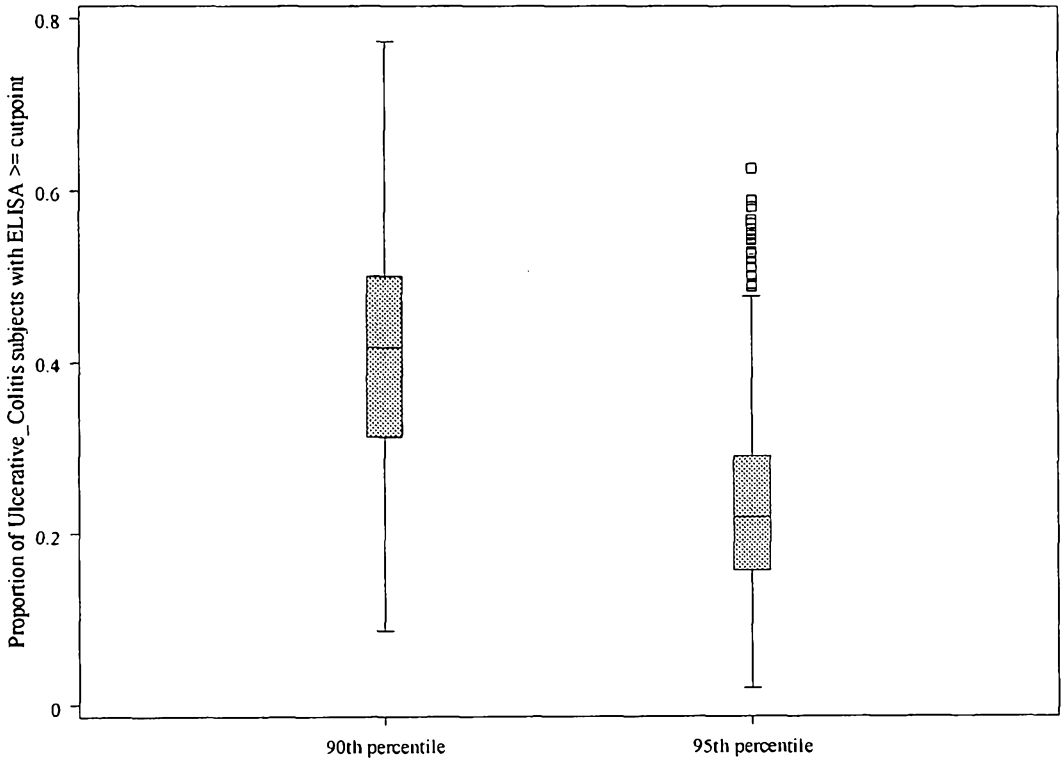

Figure 2B

Distribution of ELISA Signal Scores by Diagnosis

Sex=FEMALE Food=Cantaloupe

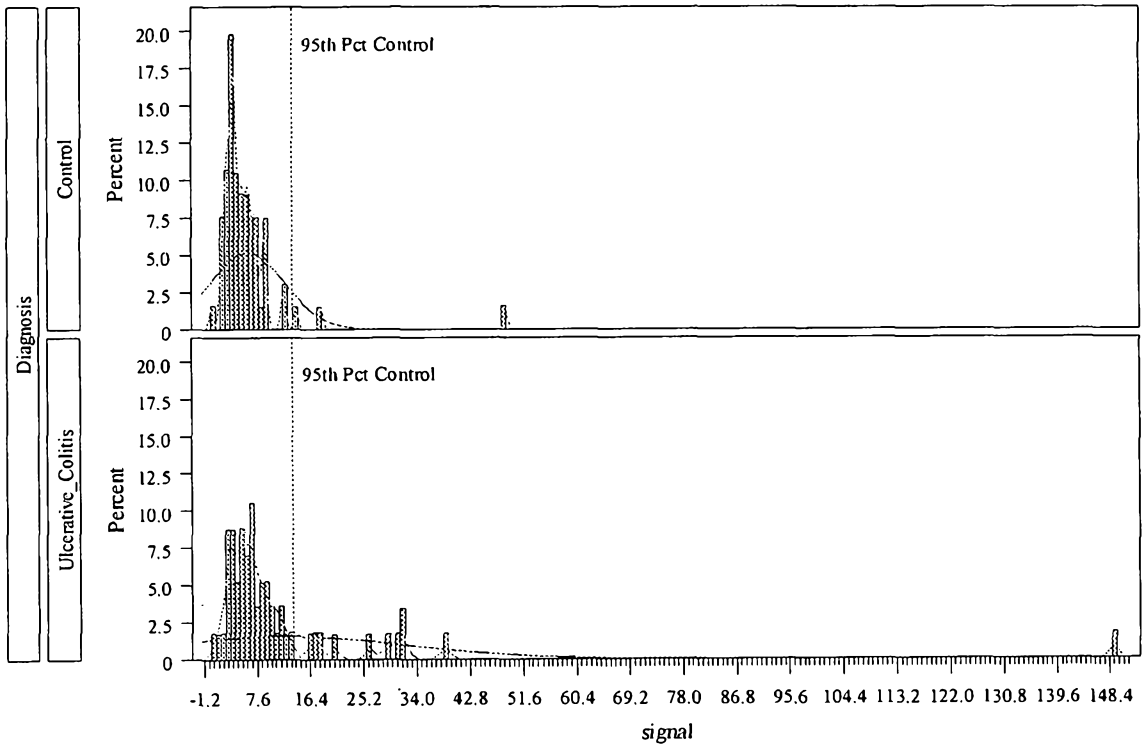

Figure 2C

Distribution of Percentage of Ulcerative Colitis Subjects with Signals >= Control Cutpoint across 1000 Bootstrapped Samples

Sex=FEMALE Food=Cantaloupe

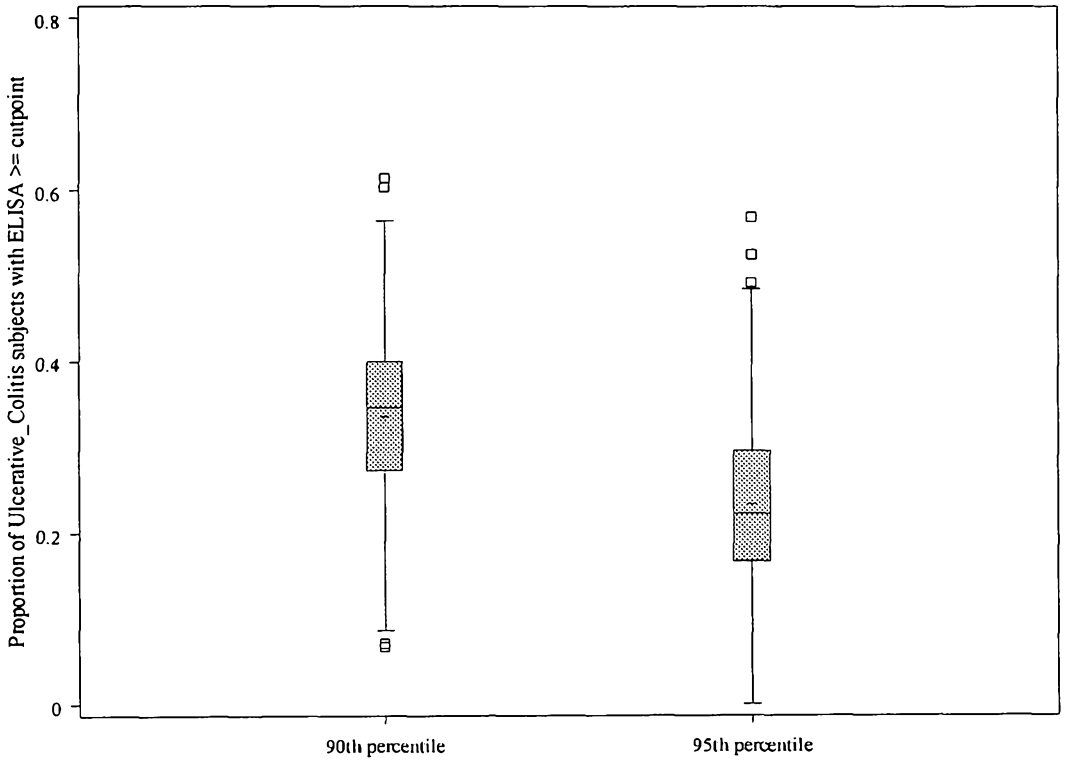

Figure 2D

Distribution of ELISA Signal Scores by Diagnosis
Sex=MALE Food=Pinto Bean

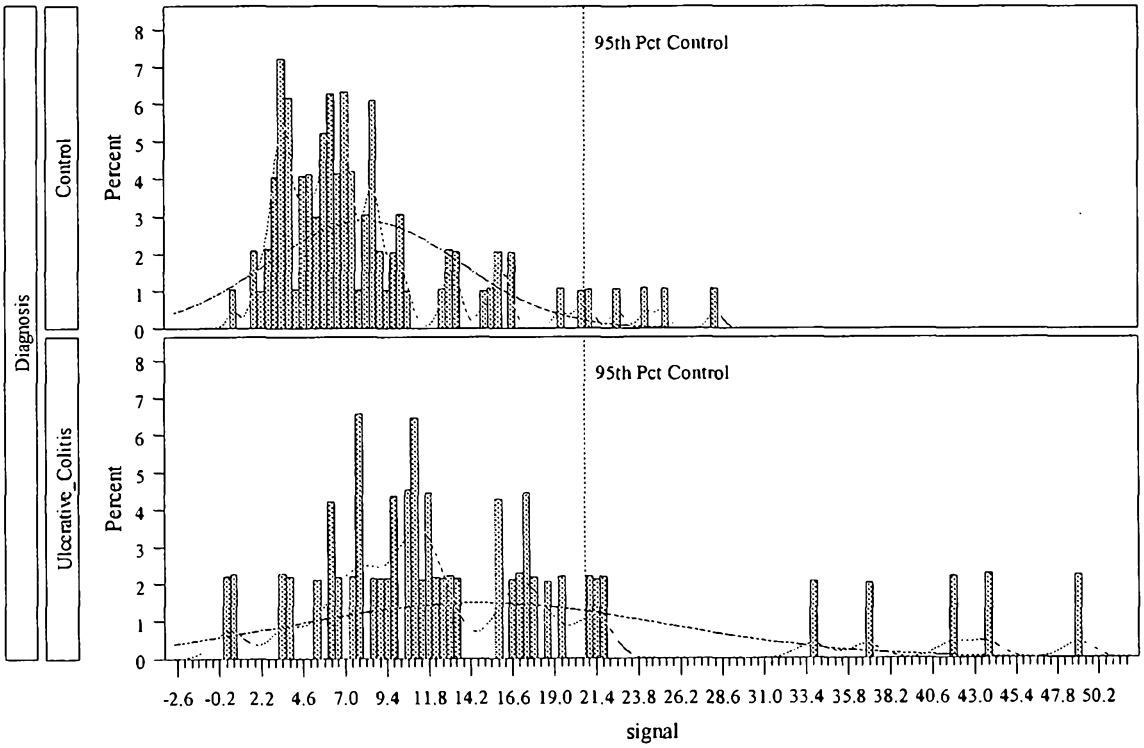

Figure 3A

Distribution of Percentage of Ulcerative Colitis Subjects with Signals >= Control Cutpoint across 1000 Bootstrapped Samples

Sex=MALE Food=Pinto Bean

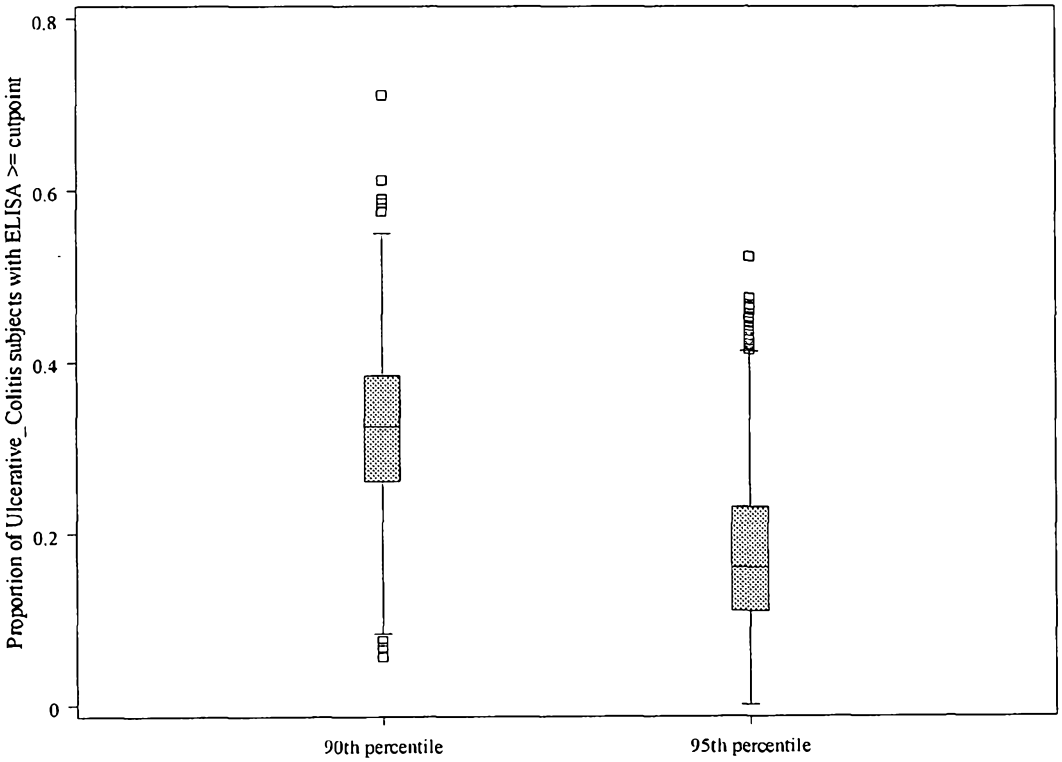

Figure 3B

Distribution of ELISA Signal Scores by Diagnosis
Sex=FEMALE Food=Pinto Bean

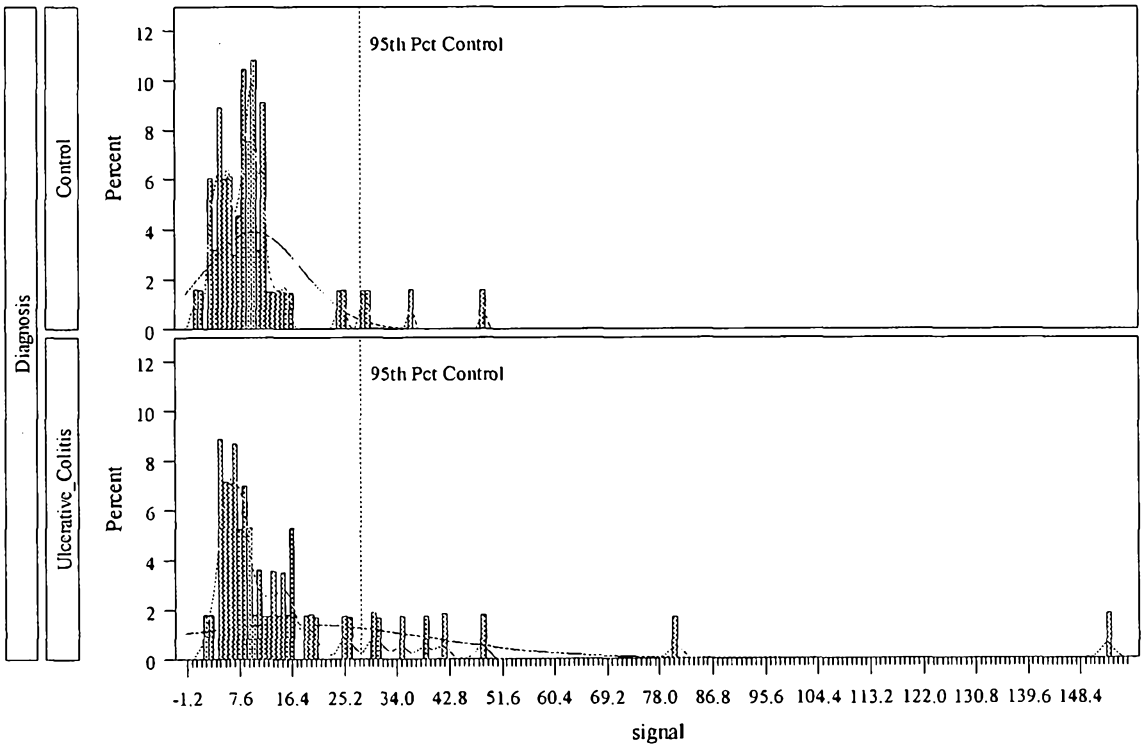

Figure 3C

Distribution of Percentage of Ulcerative Colitis Subjects with Signals >= Control Cutpoint across 1000 Bootstrapped Samples

Sex=FEMALE Food=Pinto Bean

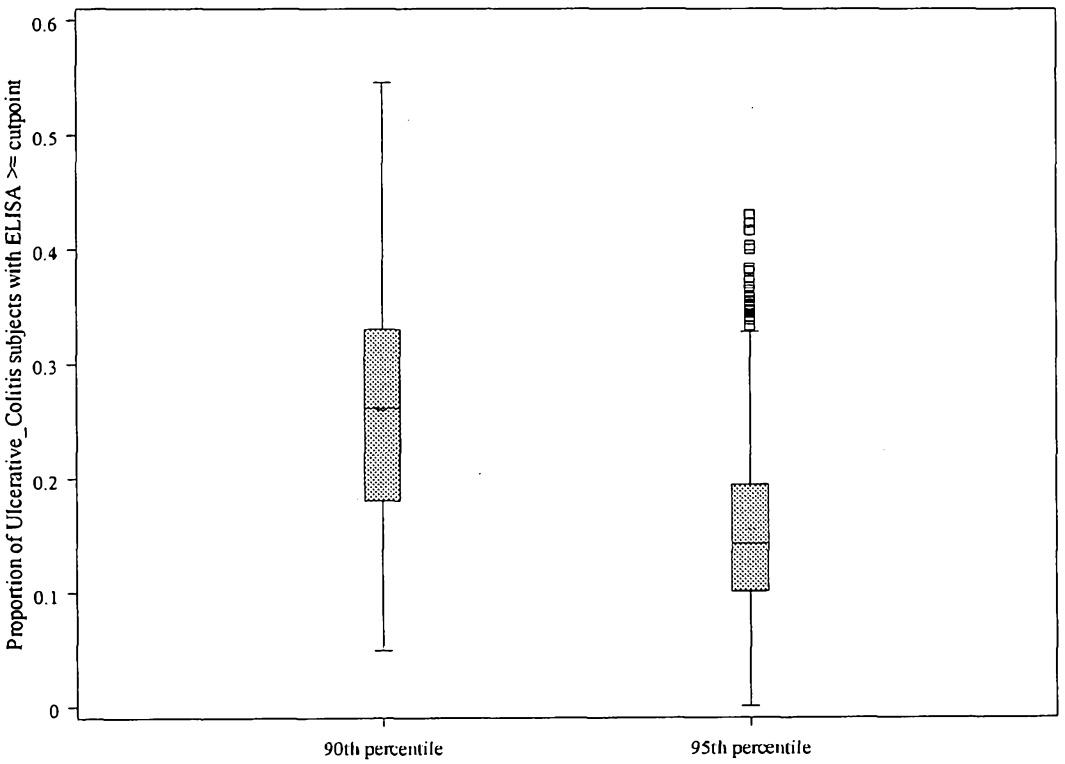

Figure 3D

Distribution of ELISA Signal Scores by Diagnosis

Sex=MALE Food=Cucumber

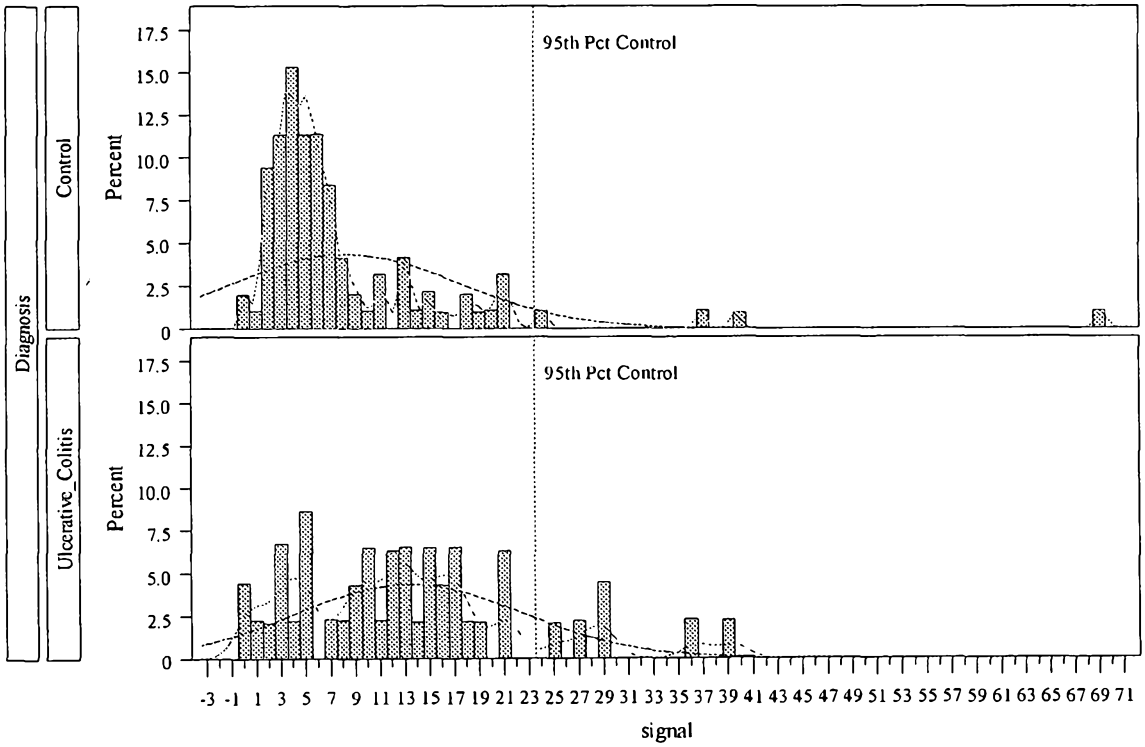

Figure 4A

Distribution of Percentage of Ulcerative Colitis Subjects with Signals >= Control Cutpoint across 1000 Bootstrapped Samples
Sex=MALE Food=Cucumber

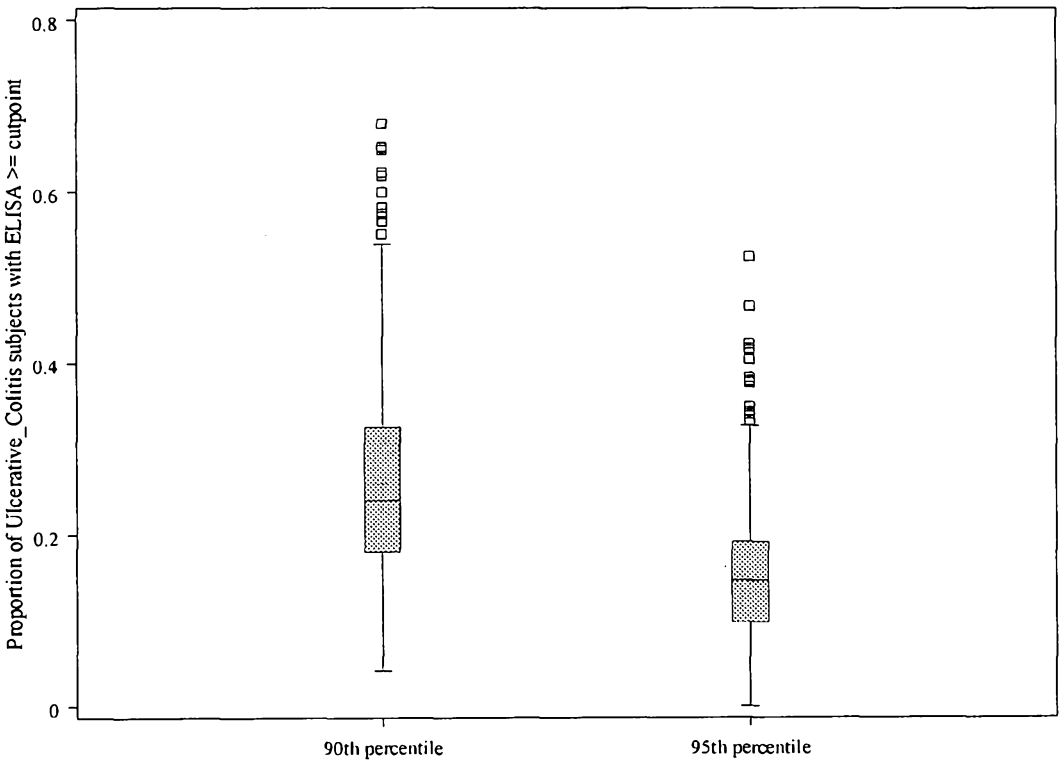

Figure 4B

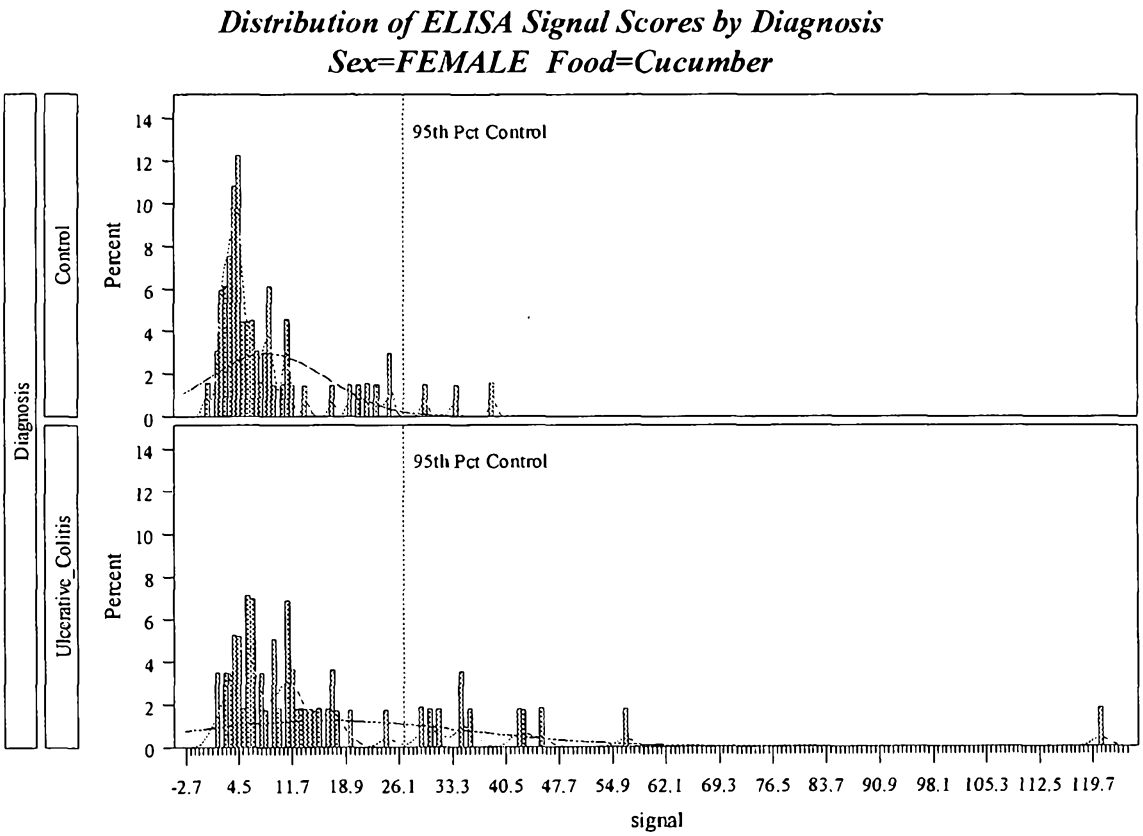
Distribution of ELISA Signal Scores by Diagnosis
Sex=FEMALE Food=Cucumber
Diagnosis
Control
Ulcerative_Colitis
Percent
95th Pct Control
95th Pct Control
0
2
4
6
8
10
12
14
-2.7
4.5
11.7
18.9
26.1
33.3
40.5
47.7
54.9
62.1
69.3
76.5
83.7
90.9
98.1
105.3
112.5
119.7
signal

Figure 4C

Distribution of Percentage of Ulcerative Colitis Subjects with Signals >= Control Cutpoint across 1000 Bootstrapped Samples
Sex=FEMALE Food=Cucumber

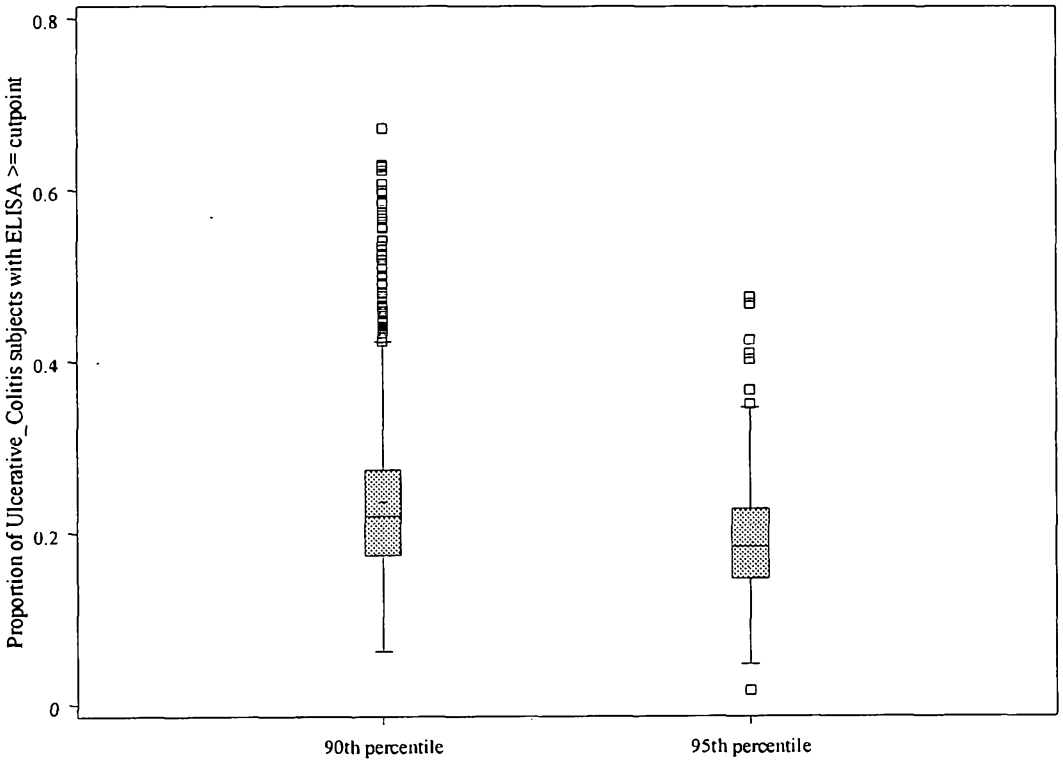

Figure 4D

Distribution of Ulcerative Colitis Subjects by Number of Foods in which they were rated as "Positive" by Sex

90th Percentile as Cutpoint

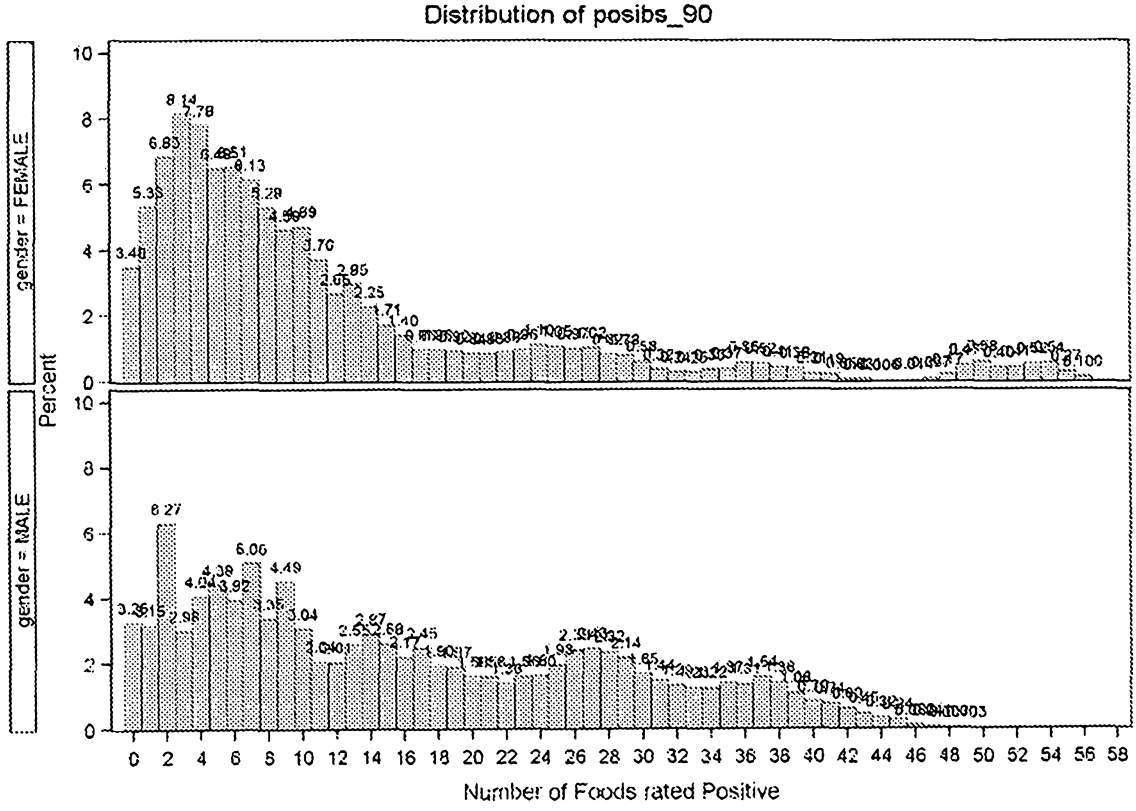

Figure 5A

Distribution of Ulcerative Colitis Subjects by Number of Foods in which they were rated as "Positive" by Sex

95th Percentile as Cutpoint

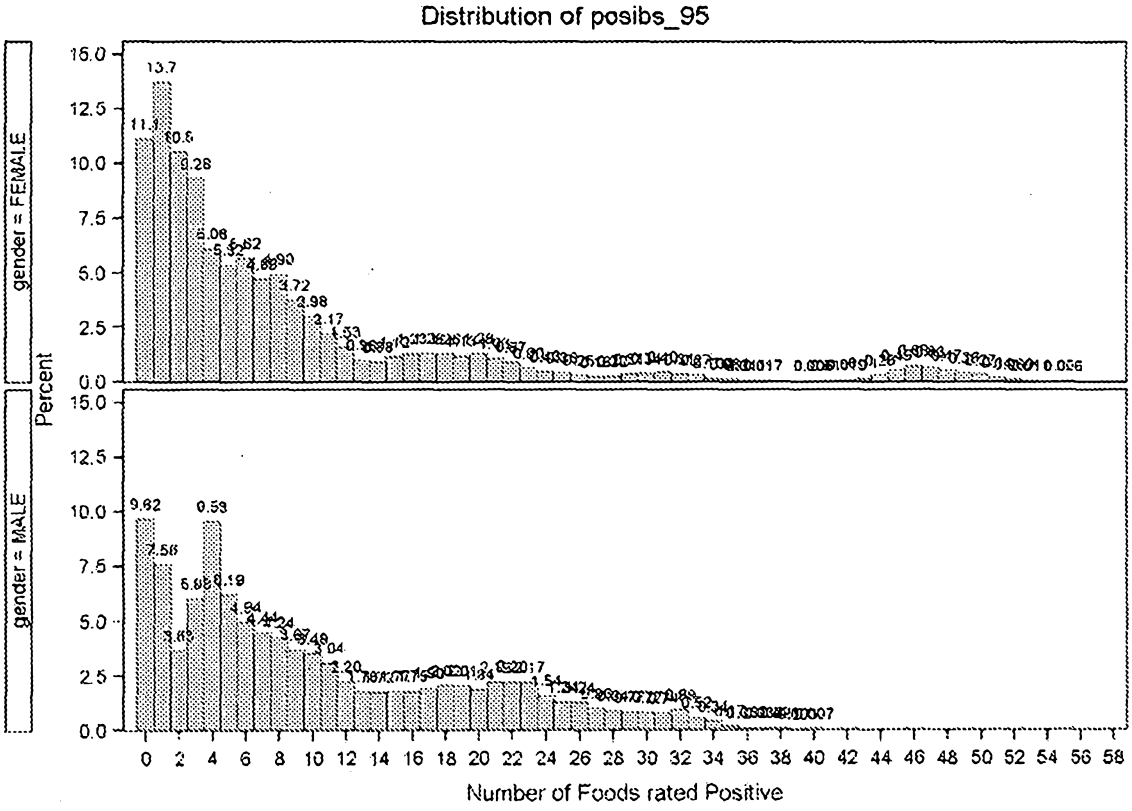

Figure 5B

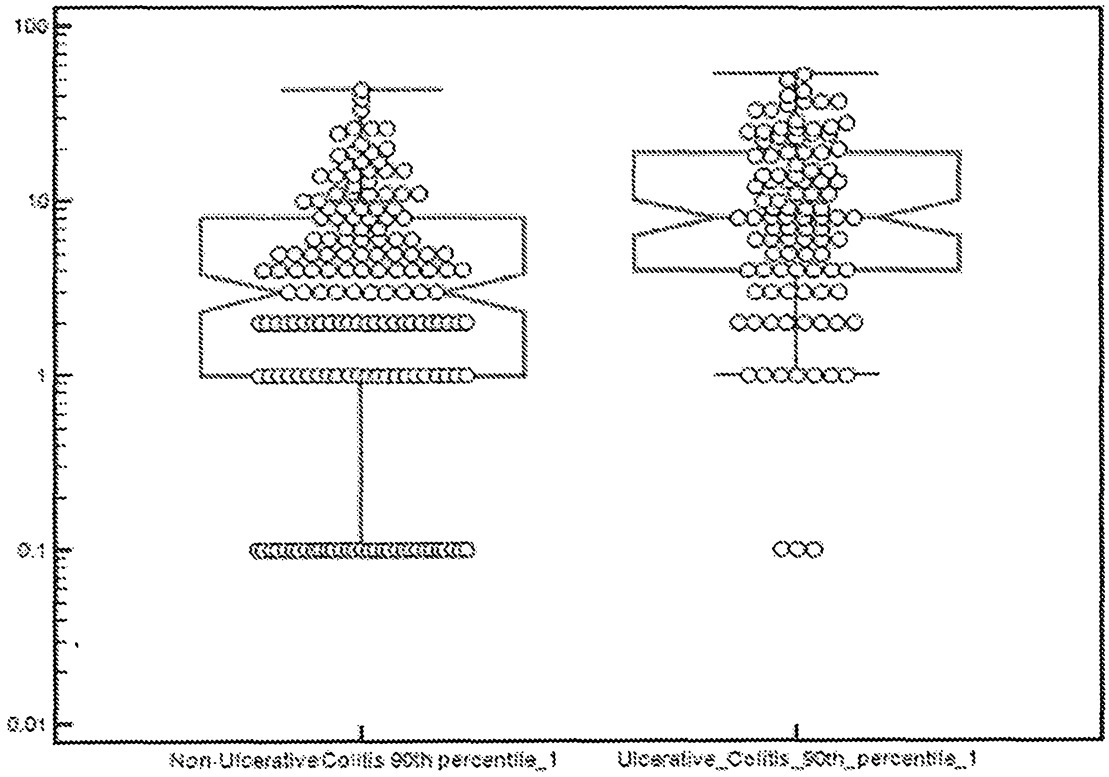
100
10
1
0.1
0.01
Non-UlcerativeColitis 95th percentile_1
Ulcerative_Colitis_50th_percentile_1

Figure 6A

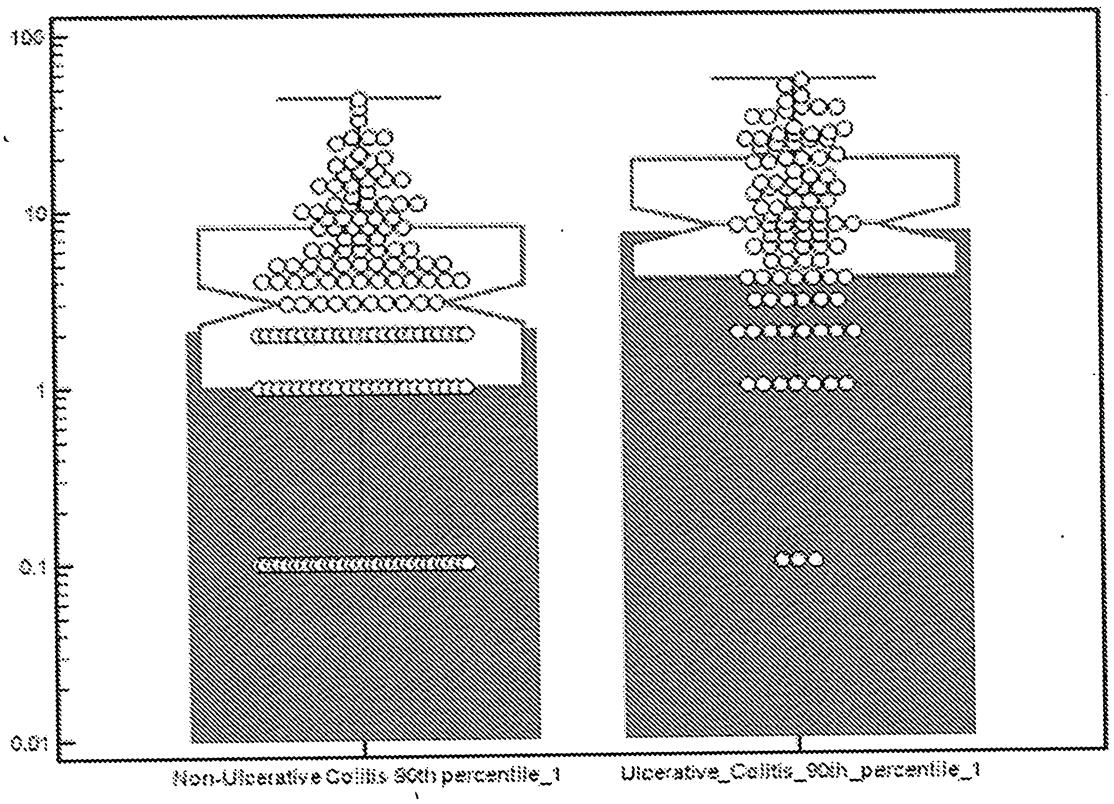
100
10
1
0.1
0.01
Non-Ulcerative Colitis 90th percentile_1
Ulcerative_Colitis_90th_percentile_1

Figure 6B

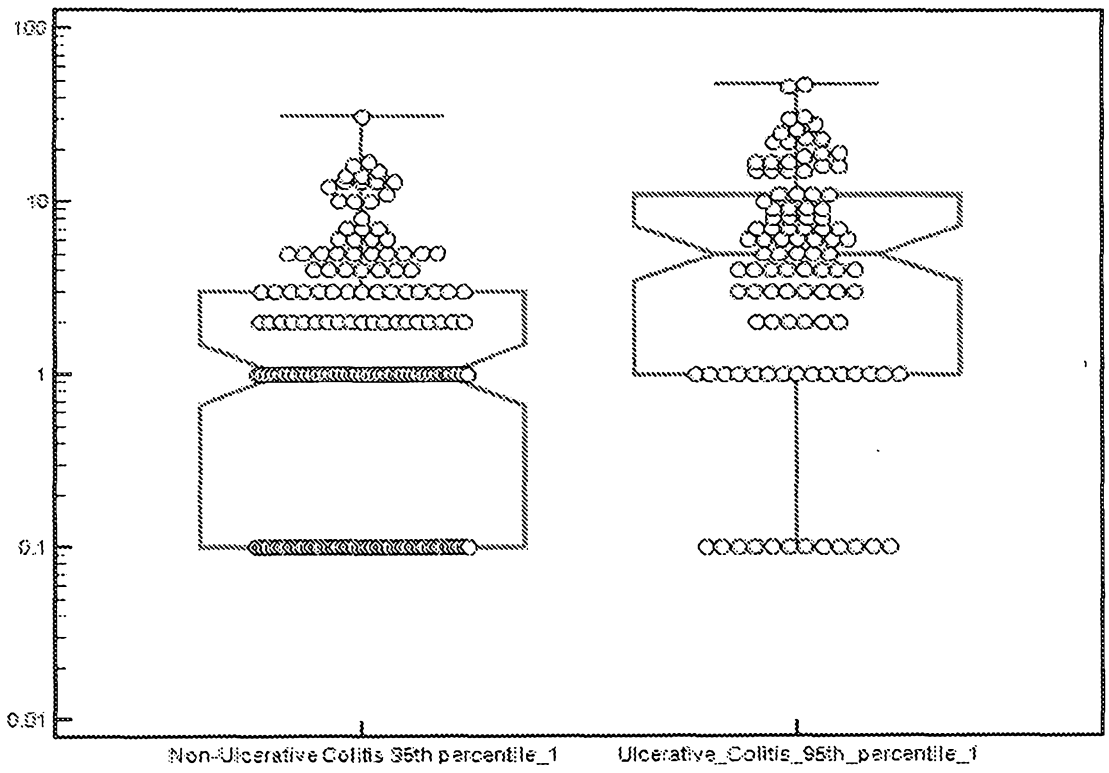
100
10
1
0.1
0.01
Non-Ulcerative Colitis 95th percentile_1
Ulcerative_Colitis_95th_percentile_1

Figure 6C

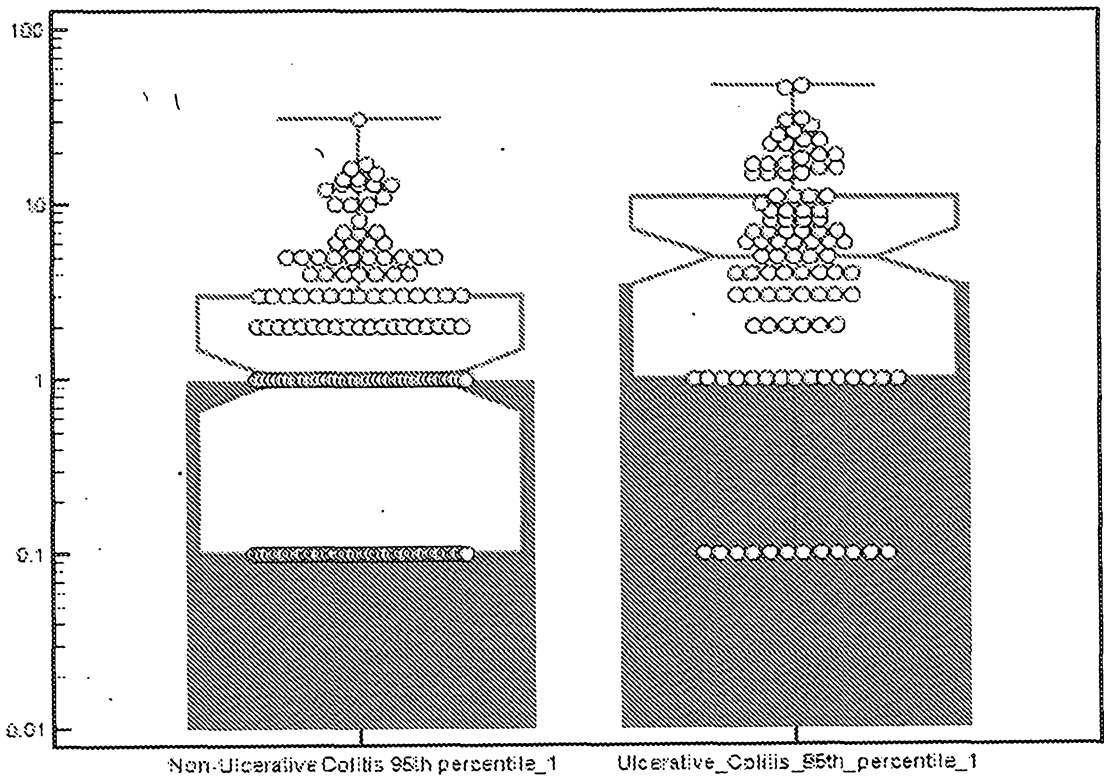
100
10
1
0.1
0.01
Non-Ulcerative Colitis 95th percentile_1
Ulcerative_Colitis_95th_percentile_1

Figure 6D

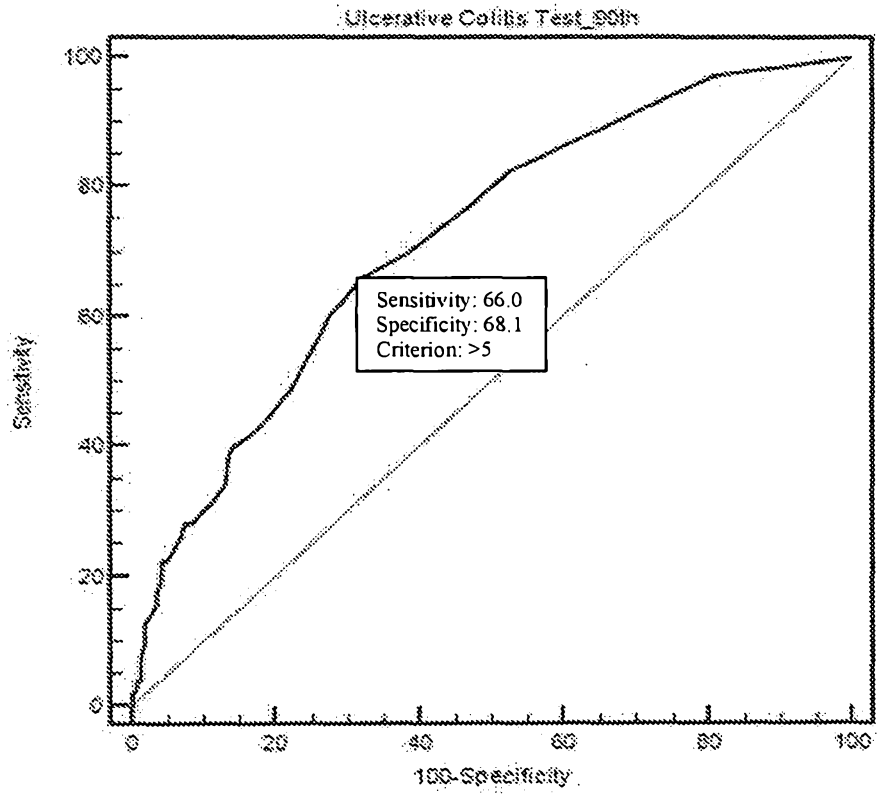
Ulcerative Colitis Test_90th
Sensitivity
100
80
60
40
20
0
0
20
40
60
80
100
100-Specificity
Sensitivity: 66.0
Specificity: 68.1
Criterion: >5

Figure 7A

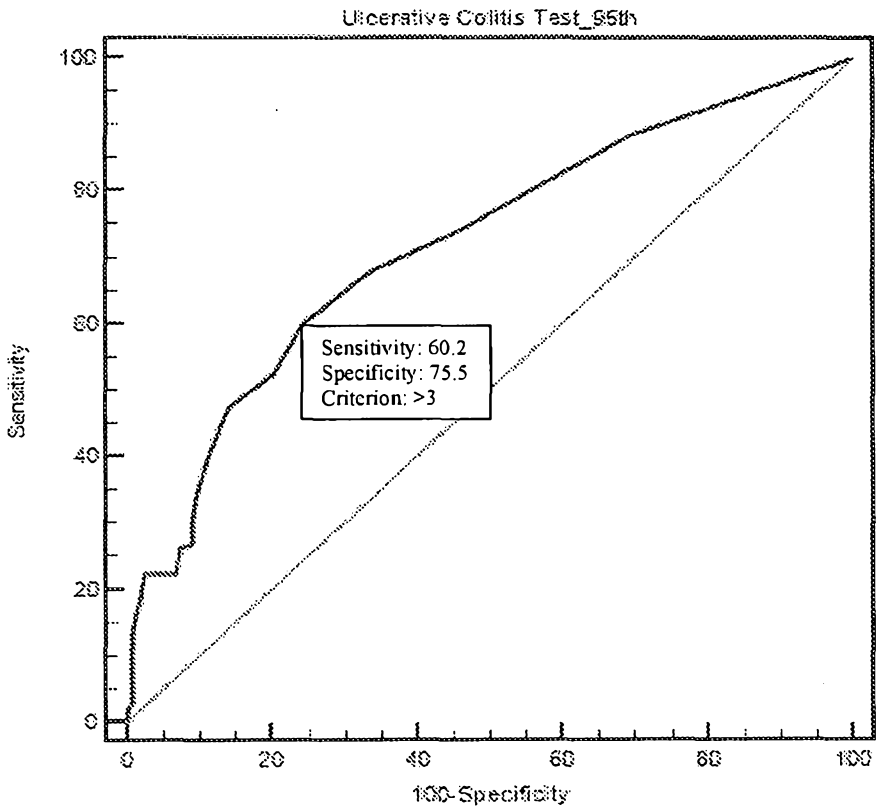
Ulcerative Colitis Test_95th
100
80
60
40
20
0
Sensitivity
Sensitivity: 60.2
Specificity: 75.5
Criterion: >3
0
20
40
60
80
100
100-Specificity

Figure 7B