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刘新宇(010-5825-6366)

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申请号或专利号：201680054790.9　　**发文序号：**2023051700147290

申请人或专利权人：拜尔梅里科有限公司

发明创造名称：用于保护患者免于产生不良反应的系统、方法和存储介质

办 理 登 记 手 续 通 知 书

根据专利法实施细则第 54 条及国家知识产权局第 244、272 号公告的规定，申请人应当于 2023 年 08 月 01 日之前缴纳以下费用：

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国家知识产权局 专利审查业务章 1101081359734

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电子申请，应当通过专利业务办理系统以电子文件形式提交相关文件。除另有规定外，以纸件等其他形式提交的文件视为未提交。

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刘新宇(010-5825-6366)

发文日：

2023 年 05 月 17 日

申请号：201680054790.9　　**发文序号：2023051700147480**

申请人：拜尔梅里科有限公司

发明创造名称：用于保护患者免于产生不良反应的系统、方法和存储介质

授 予 发 明 专 利 权 通 知 书

（进入国家阶段的 PCT 申请）

1.根据专利法第 39 条及实施细则第 54 条的规定，上述发明专利申请经实质审查，没有发现驳回理由，现作出授予专利权的通知。

申请人收到本通知书后，还应当依照办理登记手续通知书的内容办理登记手续。

申请人按期办理登记手续后，国家知识产权局将作出授予专利权的决定，颁发发明专利证书，并予以登记和公告。期满未办理登记手续的，视为放弃取得专利权的权利。

法律、行政法规规定相应技术的实施应当办理批准、登记等手续的，应依照其规定办理。

2. 授予专利权的上述发明专利申请是以下列申请文件为基础的：

☐原始提交的国际申请的中文文本或中文译文进行的。

☒针对下列申请文件进行的：

2018 年 3 月 21 日提交的说明书附图、说明书摘要、摘要附图； 2023 年 1 月 9 日提交的说明书第 1-109 段； 2023 年 5 月 6 日提交的权利要求第 1-120 项。

3.授予专利权的上述发明专利申请的名称：

☐未变更。

☒由用于基于食物敏感性测试来提供食物建议的系统和方法变更为上述发明创造名称。

4. ☐申请人于_____年_____月_____日提交专利号为_____的“放弃专利权声明”，经审查：

☐进入放弃专利权的程序。

☐未进入放弃专利权的程序。理由是：申请人声明放弃的专利与本发明专利申请不属于相同的发明创造。

5. ☐审查员依职权对申请文件修改如下：

6. ☐申请人在申请日后补交了实验数据，该数据未包含在授权公告文本中。

注：在本通知书发出后收到的申请人主动修改的申请文件，不予考虑。

国家知识产权局 专利审查业务章 1101081359734

审查员：刘璧新　　审查部门：专利审查协作四川中心

联系电话：028-62967646

纸件申请，回函请寄：100088 北京市海淀区蓟门桥西土城路 6 号　国家知识产权局专利局受理处收

电子申请，应当通过电子专利申请系统以电子文件形式提交相关文件。除另有规定外，以纸件等其他形式提交的文件视为未提交。

China National Intellectual Property Administration

1800842PCT

F16 Tower C, Beijing Global Trade Center, 36 North Third Ring East Road, Dongcheng District, Beijing 100013 P. R. China **LINDA LIU & PARTNERS** **Xinyu LIU**	Issue Date: **May 17, 2023**
Application Number: **201680054790.9**	**Issue Number: 2023051700147290**
Applicant : **BIOMERICA, INC.**	
Title of Invention : **System, method, and storage medium for protecting patient from adverse reaction**	

Notification of Completion for Formalities of Registration

The applicant is requested to pay the following fees according to the provision of Rule 54 of Implementing Regulation of the Patent Law and No. 244, 272 Announcement of the Patent Office, before **August 1, 2023**:

The 8th annual fee: CNY 2,000.0 No (reduction of fees)
Fee has been paid: annual fee CNY0.

Where the applicant pays the above fees in due time, the Patent Office will record the grant of the patent right into the patent register, issue a Letters Patent, and make announcement. The patent right will become effective as of the Date of Announcement.

Where the applicant fails to pay, or pays inadequately, the above fees within the specified time, the patent right would be deemed to have been abandoned.

Examination Department: Preliminary Examination Department

China National Intellectual Property Administration

1800842PCT

F16 Tower C, Beijing Global Trade Center, 36 North Third Ring East Road, Dongcheng District, Beijing 100013 P. R. China **LINDA LIU & PARTNERS** **Xinyu LIU**	Issue Date: **May 17, 2023**
Application Number: **201680054790.9**	**Issue Number: 2023051700147480**
Applicant: **BIOMERICA, INC.**	
Title of Invention: System, method, and storage medium for protecting patient from adverse reaction	

Notification of Decision to Grant Patent Right
(PCT application entering the national phase)

1. In accordance with the provision of Article 39 of the Patent Law and Rule 54 of Implementing Regulation of the Patent Law, where it is found after the substantive examination that there is no cause for rejection of the application, the Patent Office now makes a decision to grant the patent right.

After receiving the notification, the applicant should complete the formalities of the registration according to the Notification of Completion for Formalities of Registration.

Where the applicant completes the formalities of the registration in due time, the Patent Office will make the decision to grant patent right, issue a Letters Patent, register and announce the decision, otherwise the patent right would be deemed to have been abandoned.

2. The patent application to be granted is on the basis of the following documents
☐Chinese documents or Chinese translation of international application text initial filed.
☒The following documents:
Fig(s), abstract of specification and drawing of abstract filed on March 21, 2018;
Paragraph(s)1-109 of specification filed on January 9, 2023;
Claim(s) 1-120 filed on May 6, 2023.

3. The title of the above-mentioned application which was granted the patent right:
☐is not changed.
☒is changed from SYSTEM AND METHOD FOR PROVIDING A FOOD RECOMMENDATION BASED ON FOOD SENSITIVITY TESTING to the above-mentioned title.

4. ☐The applicant filed an announcement to abandon the patent right of the patent No._____ on ____. Upon examination:
☐Entering into the procedure of abandoning the patent right.
☐Not entering the procedure of abandoning the patent right. The reason is the patent which the applicant announced to abandon is difference from above mentioned patent.

5. ☐Examiner amends the application documents according to his authority as follows:

6. ☐The applicant submitted the experimental data after the application date, which was not included in the announcement text.

Note: Documents filed after the above notification is issued should not be accepted.

ALLOWED CLAIMS

What is claimed is:

1. A system for protecting a patient from adverse reaction to a food ingredient, wherein the system is communicatively coupled with a machine, the system comprising:
a medical database storing a patient's medical data;
a processor and a memory storing program instructions, that when executed by the processor cause the processor to perform the steps of:
deriving, from the patient's medical data, a first confidence level data indicating a probability of the patient having adverse reaction to the food ingredient;
receiving food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item;
generating, based on the first and second confidence level data, a safety level for the patient to consume the food item; and
causing the machine to restrict access of the food item according to the generated safety level.

2. The system of claim 1, wherein the patient's medical data includes patient's food sensitivity data.

3. The system of claim 1 or 2, wherein the program further causes the processor to perform a step of deriving first confidence level data from the testing of the patient for a disease using a food preparation having a reference value, wherein the reference value comprises an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

4. The system of claim 1 or 2, wherein the program further causes the processor to perform a step of deriving first confidence level data from a group data of individuals diagnosed of same disease with the patient, wherein the group data includes a reference value of a food preparation with an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

5. The system of claim 4, wherein the reference value is disease-state stratified.

6. The system of claim 4, wherein the reference value level is gender stratified.

7. The system of claim 1 or 2, wherein the program further causes the processor to perform a step of deriving first confidence level data from a group experience data diagnosed of same disease.

8. The system of claim 1 or 2, wherein the program further causes the processor to perform a step of deriving the first confidence level data from the patient's experience history.

9. The system of claim 4, wherein the group data comprises a plurality of sensitivity ratings associated with the food preparation.

10. The system of claim 4, the program further causes the processor to perform steps of:
identifying a pattern of the group data;
correlating the pattern with a probability of the patient having adverse reaction to the food ingredient; and
automatically updating the first confidence level data based on patterns of the group data.

11. The system of claim 1, wherein the program further causes the processor to perform steps of:
obtaining, from a sensor device, sensor data representing a food item; and
deriving, based on the sensor data, food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item

12. The system of claim 11, wherein the sensor data comprises spectral analysis data, and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

13. The system of claim 11, wherein the sensor data comprises chemosensing data and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

14. The system of claim 1 or 2, wherein the program further causes the processor to perform a step of deriving the second confidence level data of a food ingredient from group data comprising experience history of individuals having adverse reaction to the food item.

15. The system of claim 14, the program further causes the processor to perform steps of:
identifying a pattern of the group data;
correlating the pattern with a probability of the food ingredient existing in the food item; and
automatically updating the second confidence level data based on patterns of the group data.

16. The system of claim 1 or 2, wherein the program further causes the processor to determine the safety level low when the processor determines at least one of the first and second confidence level data is high.

17. The system of claim 16, wherein the first confidence level data is high when there is a probability of 50% or greater that the patient having adverse reaction to the food ingredient, and the second confidence level data is high when there is a probability of 50% or greater that the food ingredient existing in the food item.

18. The system of claim 16, wherein the first confidence level data is low when there is a probability of 50% or less that the patient having adverse reaction to the food ingredient, and the second confidence level data is low when there is a probability of 50% or less that the food ingredient existing in the food item.

19. The system of claim 16, wherein the safety level low when there is a probability of 50% or greater that the patient will exhibit an adverse reaction to the food item.

20. The system of claim 1 or 2, wherein the program further causes the processor to determine the safety level high when the processor determines both of the first and second confidence level data are low.

21. The system of claim 1 or 2, wherein the machine is a vending machine and the program further causes the processor to cause the vending machine fail to vend the food item when the processor determines the safety level low.

22. The system of claim 1 or 2, wherein the machine is a self check-out kiosk, and the program further causes the processor to cause the self check-out kiosk fail to check out the food items when the processor determines the safety level low.

23. The system of claim 1 or 2, wherein the machine is a self-order machine, and the program further causes the processor to cause the self-order machine fail to processes the order of the food items when the processor determines the safety level low.

24. A system for protecting a patient from adverse reaction to a food ingredient, wherein the system is communicatively coupled with a machine, the system comprising:
a medical database storing a patient's medical data;
a processor and a memory storing program instructions, that when executed by the processor cause the processor to perform the steps of:
deriving, from the patient's medical data, a first confidence level data indicating a probability of the patient having adverse reaction to the food ingredient;
receiving food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item;
generating, based on the first and second confidence level data, a safety level for the patient to consume the food item; and
causing a machine to display a food recommendation according to the generated safety level.

25. The system of claim 24, wherein the patient's medical data includes patient's food sensitivity data.

26. The system of claim 24 or 25, wherein the program further causes the processor to perform a step of deriving first confidence level data from the testing of the patient for a disease using a food preparation having a reference value, wherein the reference value comprises an

average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

27. The system of claim 24 or 25, wherein the program further causes the processor to perform a step of deriving first confidence level data from a group data of individuals diagnosed of same disease with the patient, wherein the group data includes a reference value of a food preparation with an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

28. The system of claim 27, wherein the reference value is disease-state stratified.

29. The system of claim 27, wherein the reference value level is gender stratified.

30. The system of claim 27, wherein the group data comprises experience data of the individuals diagnosed of same disease.

31. The system of claim 24 or 25, wherein the program further causes the processor to perform a step of deriving the first confidence level data from the patient's experience history.

32. The system of claim 27, wherein the group data comprises a plurality of sensitivity ratings associated with the food preparation.

33. The system of claim 27, the program further causes the processor to perform steps of:
identifying a pattern of the group data;
correlating the pattern with a probability of the patient having adverse reaction to the food ingredient; and
automatically updating the first confidence level data based on patterns of the group data.

34. The system of claim 24, wherein the program further causes the processor to perform steps of:
obtaining, from a sensor device, sensor data representing a food item; and
deriving, based on the sensor data, food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item

35. The system of claim 34, wherein the sensor data comprises spectral analysis data, and the step of deriving the second confidence level data includes steps of 1) identifying a food

ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

36. The system of claim 34, wherein the sensor data comprises chemosensing data and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

37. The system of claim 24 or 25, wherein the program further causes the processor to perform a step of deriving the second confidence level data of a food ingredient from group data comprising experience history of individuals having adverse reaction to the food item.

38. The system of claim 37, the program further causes the processor to perform steps of:

identifying a pattern of the group data;

correlating the pattern with a probability of the food ingredient existing in the food item; and

automatically updating the second confidence level data based on patterns of the group data.

39. The system of claim 24 or 25, wherein the program further causes the processor to determine the safety level low when the processor determines at least one of the first and second confidence level data is high.

40. The system of claim 24 or 25, wherein the program further causes the processor to determine the safety level high when the processor determines both of the first and second confidence level data are low.

41. The system of claim 24 or 25, wherein the recommendation comprises alternative food items to the food item if the second confidence level data is higher than the first confidence level data.

42. The system of claim 41, wherein the program further causes the processor to cause the machine to display a promotional material with the alternative food items.

43. A method for protecting a patient from adverse reaction to a food ingredient, comprising:

deriving, from the patient's medical data, a first confidence level data indicating a probability of the patient having adverse reaction to the food ingredient;

receiving food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item;

generating, based on the first and second confidence level data, a safety level for the patient to consume the food item; and

causing the machine to restrict access of the food item according to the generated safety level.

44. The method of claim 43, wherein the patient's medical data includes patient's food sensitivity data.

45. The method of claim43 or 44, further comprising: deriving first confidence level data from the testing of the patient for a disease using a food preparation having a reference value, wherein the reference value comprises an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

46. The method of claim 43 or 44, further comprising: deriving first confidence level data from a group data of individuals diagnosed of same disease with the patient, wherein the group data includes a reference value of a food preparation with an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

47. The method of claim 46, wherein the reference value is disease-state stratified.

48. The method of claim 46, wherein the reference value level is gender stratified.

49. The method of claim 43 or 44, further comprising: deriving first confidence level data from a group experience data diagnosed of same disease.

50. The method of claim 43 or 44, further comprising: deriving the first confidence level data from the patient's experience history.

51. The method of claim 46, wherein the group data comprises a plurality of sensitivity ratings associated with the food preparation.

52. The method of claim 46, further comprising:

identifying a pattern of the group data;

correlating the pattern with a probability of the patient having adverse reaction to the food ingredient; and

automatically updating the first confidence level data based on patterns of the group data.

53. The method of claim 43, further comprising:

obtaining, from a sensor device, sensor data representing a food item; and

deriving, based on the sensor data, food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item

54. The method of claim 53, wherein the sensor data comprises spectral analysis data, and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

55. The method of claim 53, wherein the sensor data comprises chemosensing data and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

56. The method of claim 43 or 44, further comprising: deriving the second confidence level data of a food ingredient from group data comprising experience history of individuals having adverse reaction to the food item.

57. The method of claim 56, further comprising:

identifying a pattern of the group data;

correlating the pattern with a probability of the food ingredient existing in the food item; and

automatically updating the second confidence level data based on patterns of the group data.

58. The method of claim 43 or 44, further comprising: determining the safety level low when the processor determines at least one of the first and second confidence level data is high.

59. The method of claim 43 or 44, further comprising: determining the safety level high when the processor determines both of the first and second confidence level data are low.

60. The method of claim 43 or 44, wherein the machine is a vending machine and the method further comprising: causing the vending machine fail to vend the food item when the processor determines the safety level low.

61. The method of claim 43 or 44, wherein the machine is a self check-out kiosk, and the method further comprising: causing the self check-out kiosk fail to check out the food items when the processor determines the safety level low.

62. The method of claim 43 or 44, wherein the machine is a self-order machine, and the method further comprising: causing the self-order machine fail to processes the order of the food items when the processor determines the safety level low.

63. A method for protecting a patient from adverse reaction to a food ingredient, comprising:

deriving, from the patient's medical data, a first confidence level data indicating a probability of the patient having adverse reaction to the food ingredient;

receiving food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item;

generating, based on the first and second confidence level data, a safety level for the patient to consume the food item; and

causing a machine to display a food recommendation according to the generated safety level.

64. The method of claim 63, wherein the patient's medical data includes patient's food sensitivity data.

65. The method of claim 63 or 64, further comprising: deriving first confidence level data from the testing of the patient for a disease using a food preparation having a reference value, wherein the reference value comprises an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

66. The method of claim 63 or 64, further comprising: deriving first confidence level data from a group data of individuals diagnosed of same disease with the patient, wherein the group data includes a reference value of a food preparation with an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

67. The method of claim 66, wherein the reference value is disease-state stratified.

68. The method of claim 66, wherein the reference value level is gender stratified.

69. The method of claim 66, wherein the group data comprises experience data of the individuals diagnosed of same disease.

70. The method of claim 63 or 64, further comprising: deriving the first confidence level data from the patient's experience history.

71. The method of claim 66, wherein the group data comprises a plurality of sensitivity ratings associated with the food preparation.

72. The method of claim 66, further comprising:
identifying a pattern of the group data;
correlating the pattern with a probability of the patient having adverse reaction to the food ingredient; and
automatically updating the first confidence level data based on patterns of the group data.

73. The method of claim 63, further comprising:
obtaining, from a sensor device, sensor data representing a food item; and
deriving, based on the sensor data, food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item

74. The method of claim 73, wherein the sensor data comprises spectral analysis data, and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

75. The method of claim 73, wherein the sensor data comprises chemosensing data and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

76. The method of claim 63 or 64, further comprising: deriving the second confidence level data of a food ingredient from group data comprising experience history of individuals having adverse reaction to the food item.

77. The method of claim 76, further comprising:

identifying a pattern of the group data;

correlating the pattern with a probability of the food ingredient existing in the food item; and

automatically updating the second confidence level data based on patterns of the group data.

78. The method of claim 63 or 64, further comprising: determining the safety level low when the processor determines at least one of the first and second confidence level data is high.

79. The method of claim 63 or 64, further comprising: determining the safety level high when the processor determines both of the first and second confidence level data are low.

80. The method of claim 63 or 64, wherein the recommendation comprises alternative food items to the food item if the second confidence level data is higher than the first confidence level data.

81. The method of claim 80, further comprising: causing the machine to display a promotional material with the alternative food items.

82. A computer-readable non-transitory storage medium comprising programming instructions that when executed by one or more processors cause the one or more processors to perform the following steps:

deriving, from the patient's medical data, a first confidence level data indicating a probability of the patient having adverse reaction to the food ingredient;

receiving food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item;

generating, based on the first and second confidence level data, a safety level for the patient to consume the food item; and

causing the machine to restrict access of the food item according to the generated safety level.

83. The medium of claim 82, wherein the patient's medical data includes patient's food sensitivity data.

84. The medium of claim 82 or 83, wherein the program further causes the processor to perform a step of deriving first confidence level data from the testing of the patient for a disease using a food preparation having a reference value, wherein the reference value comprises an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

85. The medium of claim 82 or 83, wherein the program further causes the processor to perform a step of deriving first confidence level data from a group data of individuals diagnosed of same disease with the patient, wherein the group data includes a reference value of a food preparation with an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

86. The medium of claim 85, wherein the reference value is disease-state stratified.

87. The medium of claim 85, wherein the reference value level is gender stratified.

88. The medium of claim 82 or 83, wherein the program further causes the processor to perform a step of deriving first confidence level data from a group experience data diagnosed of same disease.

89. The medium of claim 82 or 83, wherein the program further causes the processor to perform a step of deriving the first confidence level data from the patient's experience history.

90. The medium of claim 85, wherein the group data comprises a plurality of sensitivity ratings associated with the food preparation.

91. The medium of claim 85, the program further causes the processor to perform steps of:

identifying a pattern of the group data;

correlating the pattern with a probability of the patient having adverse reaction to the food ingredient; and

automatically updating the first confidence level data based on patterns of the group data.

92. The medium of claim 82, wherein the program further causes the processor to perform steps of:

obtaining, from a sensor device, sensor data representing a food item; and

deriving, based on the sensor data, food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item

93. The medium of claim 92, wherein the sensor data comprises spectral analysis data, and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

94. The medium of claim 92, wherein the sensor data comprises chemosensing data and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

95. The medium of claim 82 or 83, wherein the program further causes the processor to perform a step of deriving the second confidence level data of a food ingredient from group data comprising experience history of individuals having adverse reaction to the food item.

96. The medium of claim 95, the program further causes the processor to perform steps of:

identifying a pattern of the group data;

correlating the pattern with a probability of the food ingredient existing in the food item; and

automatically updating the second confidence level data based on patterns of the group data.

97. The medium of claim 82 or 83, wherein the program further causes the processor to determine the safety level low when the processor determines at least one of the first and second confidence level data is high.

98. The medium of claim 82 or 83, wherein the program further causes the processor to determine the safety level high when the processor determines both of the first and second confidence level data are low.

99. The medium of claim 82 or 83, wherein the machine is a vending machine and the program further causes the processor to cause the vending machine fail to vend the food item when the processor determines the safety level low.

100. The medium of claim 82 or 83, wherein the machine is a self check-out kiosk, and the program further causes the processor to cause the self check-out kiosk fail to check out the food items when the processor determines the safety level low.

101. The medium of claim 82 or 83, wherein the machine is a self-order machine, and the program further causes the processor to cause the self-order machine fail to processes the order of the food items when the processor determines the safety level low.

102. A computer-readable non-transitory storage medium comprising programming instructions that when executed by one or more processors cause the one or more processors to perform the following steps:

deriving, from the patient's medical data, a first confidence level data indicating a probability of the patient having adverse reaction to the food ingredient;

receiving food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item;

generating, based on the first and second confidence level data, a safety level for the patient to consume the food item; and

causing a machine to display a food recommendation according to the generated safety level.

103. The medium of claim 102, wherein the patient's medical data includes patient's food sensitivity data.

104. The medium of claim 102 or 103, wherein the program further causes the processor to perform a step of deriving first confidence level data from the testing of the patient for a disease using a food preparation having a reference value, wherein the reference value comprises an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

105. The medium of claim 102 or 103, wherein the program further causes the processor to perform a step of deriving first confidence level data from a group data of individuals diagnosed of same disease with the patient, wherein the group data includes a reference value of a food preparation with an average discriminatory p-value of ≤ 0.15 for individuals not diagnosed with or suspected of having the same disease.

106. The medium of claim 105, wherein the reference value is disease-state stratified.

107. The medium of claim 105, wherein the reference value level is gender stratified.

108. The medium of claim 105, wherein the group data comprises experience data of the individuals diagnosed of same disease.

109. The medium of claim 102 or 103, wherein the program further causes the processor to perform a step of deriving the first confidence level data from the patient's experience history.

110. The medium of claim 105, wherein the group data comprises a plurality of sensitivity ratings associated with the food preparation.

111. The medium of claim 105, the program further causes the processor to perform steps of:
identifying a pattern of the group data;
correlating the pattern with a probability of the patient having adverse reaction to the food ingredient; and
automatically updating the first confidence level data based on patterns of the group data.

112. The medium of claim 102, wherein the program further causes the processor to perform steps of:
obtaining, from a sensor device, sensor data representing a food item; and

deriving, based on the sensor data, food ingredient information comprising a second confidence level data indicating a probability of the food ingredient existing in the food item

113. The medium of claim 112, wherein the sensor data comprises spectral analysis data, and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

114. The medium of claim 112, wherein the sensor data comprises chemosensing data and the step of deriving the second confidence level data includes steps of 1) identifying a food ingredient that is likely to exist in the food item, and 2) assigning a probability of the food ingredient.

115. The medium of claim 102 or 103, wherein the program further causes the processor to perform a step of deriving the second confidence level data of a food ingredient from group data comprising experience history of individuals having adverse reaction to the food item.

116. The medium of claim 115, the program further causes the processor to perform steps of:
identifying a pattern of the group data;
correlating the pattern with a probability of the food ingredient existing in the food item; and
automatically updating the second confidence level data based on patterns of the group data.

117. The medium of claim 102 or 103, wherein the program further causes the processor to determine the safety level low when the processor determines at least one of the first and second confidence level data is high.

118. The medium of claim 102 or 103, wherein the program further causes the processor to determine the safety level high when the processor determines both of the first and second confidence level data are low.

119. The medium of claim 102 or 103, wherein the recommendation comprises alternative food items to the food item if the second confidence level data is higher than the first confidence level data.

120. The medium of claim 119, wherein the program further causes the processor to cause the machine to display a promotional material with the alternative food items.