CLAIMS

What is claimed is:

1. A method for detecting a yeast cell wall component in a sample, comprising:
   - providing a sample of food or feed selected from the group consisting of livestock feed, companion animal feed, Total Mixed Ration (TMR), forage, feed pellet, food concentrate, feed premix coproduct, grain, distiller grain, molasses, fiber, fodder, grass, hay, kernel, leaves, meal, soluble feed, and extracts thereof;
   - conducting an assay comprising contacting a primary antibody capable of binding to an antigen selected from the group consisting of (1→4)-α-D-glucan, (1→6)-β-D-glucan, and (1→4)-α-/(1→6)-β-D-glucan to the sample under conditions such that the primary antibody forms a complex with the antigen, if present; and
   - using a secondary antibody to detect the primary antibody-antigen complex, wherein detecting the primary antibody-antigen complex provides an indication of the presence of the yeast cell wall component in the sample.

2. The method of claim 1, wherein the method comprises obtaining the extract form the sample using organic solvent and acid.

3. The method of claim 1, wherein the method comprises obtaining the extract form the sample using dimethylsulfoxide and hydrochloric acid.

4. The method of claim 2, wherein the method comprises incubating the sample with the organic solvent and acid at a temperature above room temperature.

5. The method of claim 4, wherein said incubating occurs between 75°C and 85°C.

6. The method of claim 1, wherein said primary antibody is monospecific for said antigen.

7. The method of claim 1, wherein said primary antibody is a polyclonal antibody.

8. The method of claim 1, wherein the secondary antibody is conjugated to a substance selected from the group consisting of an enzyme, a fluorogenic material, a chromogenic material, and a radiolabelled isotope.

9. The method of claim 1, wherein said secondary antibody is able to form a complex with said primary antibody.

10. The method of claim 1, wherein said sample is immobilized on a rigid support.

11. The method of claim 10, wherein said rigid support comprises a well of a multiwall plate.

CLAIMS

What is claimed is:

1. A method for detecting a yeast cell wall in a sample, comprising:
   - providing a sample;
   - exposing said sample to a primary antibody capable of binding to an antigen selected from the group consisting of (1→4)-α-D-glucan, (1→6)-β-D-glucan, and (1→4)-α-/(1→6)-β-D-glucan thereby forming a primary antibody-antigen complex; and
   - detecting the degree of binding between said primary antibody and said antigen using a secondary antibody.

2. The method of claim 1, wherein said sample is derived from a substance selected from the group consisting of livestock feed, companion animal feed, feedstuff, Total Mixed Ration (TMR), forage, feed pellet, feed concentrate, feed premix coproduct, grain, distiller grain, molasses, fiber, fodder, grass, hay, kernel, leaves, meal, soluble feed, feed supplement, and manufacturing intermediates thereof.

3. The method of claim 2, wherein said derivation is achieved by extraction of said substance to yield said sample.

4. The method of claim 3, wherein said extraction is conducted using a step selected from the group consisting of acid extraction, alkali extraction, organic extraction, physical processing, and a combination thereof.

5. The method of claim 4, wherein said extraction is conducted using organic solvent and acid.

6. The method of claim 5, wherein said extraction is conducted using dimethylsulfoxide and hydrochloric acid.

7. The method of claim 4, wherein said extraction step further comprises incubation at a temperature above room temperature.

8. The method of claim 7, wherein said incubation occurs between 75°C and 85°C.

9. The method of claim 1, wherein said primary antibody is monospecific for said antigen.

10. The method of claim 1, wherein said primary antibody is a polyclonal antibody.

11. The method of claim 1, wherein detecting the degree of binding between said antibody and said antigen is done with the aid of secondary antibody which is conjugated to a substance selected from the group consisting of an enzyme, a fluorogenic material, a chromogenic material, and a radiolabelled isotope.

12. The method of claim 1, wherein said secondary antibody is able to form a complex with said primary antibody.

13. The method of claim 1, wherein said sample is immobilized on a rigid support.

14. The method of claim 13, wherein said rigid support comprises a well of a multiwall plate.

15. The method of claim 1, wherein said detection of binding between said primary antibody and said antigen is achieved by determining the level of a signal corresponding to the presence of said secondary antibody bound to said primary antibody-antigen complex in said sample.

16. The method of claim 15, wherein said signal is selected from the group consisting of a chromogenic signal, a fluorescent signal, a molecule detected on the basis of size, a molecule detected on the basis of light absorbance, radiation, and an isotopic signal.

17. The method of claim 1, wherein said detecting is conducted using an ELISA immunoassay.

18. A method for preparing an immunogenic composition comprising a yeast cell wall carbohydrate comprising:

- providing a sample comprising yeast cell wall;
- extracting said yeast cell wall carbohydrate from said sample using an action selected from the group consisting of acid treatment, alkali treatment, and physical treatment; and
- separating said yeast cell wall carbohydrate from said sample, wherein said yeast cell wall carbohydrate is a carbohydrate selected from the group consisting of (1→4)-α-D-glucan, (1→6)-β-D-glucan, and (1→4)-α-/(1→6)-β-D-glucan,.

19. The method of claim 18, wherein said extracting is conducted using acid treatment.

20. The method of claim 19, wherein said acid is hydrochloric acid.

21. The method of claim 18, further comprising purification of said separated yeast cell wall carbohydrate.

22. The method of claim 21, wherein said purification is achieved by a step selected from the group consisting of separation on the basis of size, separation on the basis of charge, separation on the basis of hydrophobicity, separation on the basis of affinity to a binding molecule, and separation on the basis of molecular conformation.

23. The method of claim 18, further comprising mild oxidation of said separated yeast cell wall carbohydrate.

24. The method of claim 23, wherein said mild oxidation is achieved by treatment with an oxidizing agent.

25. The method of claim 24, wherein said mild oxidation is achieved by treatment of said yeast cell wall carbohydrate with dimethylsulfoxide and acetic anhydride.

26. The method of claim 24, wherein said mild oxidation results in activation of said yeast cell wall carbohydrate.

27. The method of claim 26, wherein said activation occurs at a C6 position of said yeast cell wall carbohydrate.

28. The method of claim 26, wherein said activation results in the formation of an aldehyde group.

29. The method of claim 26, further comprising exposure of said activated yeast cell wall carbohydrate to a carrier molecule selected from the group consisting of bovine serum albumin, keyhole limpet hemocyanin, ovalbumin, and bovine thyroglobulin..

30. The method of claim 29, wherein said carrier molecule is bovine serum albumin.

31. An immunogenic composition comprising (1→4)-α-/(1→6)-β-D-glucan covalently linked to a protein.

32. The immunogenic composition of claim 31, wherein said composition is produced from a *Saccharomyces cerevisiae* yeast organism.

33. The immunogenic composition of claim 31, wherein said covalent linkage occurs through a C6 atom of said carbohydrate.

34. A composition comprising an antibody capable of binding to a yeast cell wall carbohydrate selected from the group consisting of (1→4)-α-D-glucan, (1→6)-β-D-glucan, and (1→4)-α-/(1→6)-β-D-glucan.

35. The antibody of claim 34, wherein said antibody is a monoclonal antibody.

36. The antibody of claim 34, wherein said antibody is a polyclonal antibody.

37. The antibody of claim 34, wherein said antibody is capable of binding (1→4)-α-D-glucan.

38. The antibody of claim 34, wherein said antibody is capable of binding (1→6)-β-D-glucan.

39. A method for preparing antibodies to detect yeast cell wall in a sample, comprising immunizing a host animal with the immunogenic composition of claim 31.

40. A kit for the detection of yeast cell wall in a sample, comprising:

- reagents for an extraction step, said extraction step resulting in releasing yeast cell wall carbohydrate selected from the group consisting of (1→4)-α-D-glucan, (1→6)-β-D-glucan, and (1→4)-α-/(1→6)-β-D-glucan; and
- a primary antibody capable of binding to the yeast cell wall carbohydrate extracted in said extraction step thereby forming a primary antibody-antigen complex; and
- a secondary antibody capable of attaching to said primary antibody-antigen complex thereby forming a primary antibody-antigen-secondary antibody complex.

41. The kit of claim 40, whereby said secondary antibody is conjugated to a substance selected from the group consisting of an enzyme, a fluorogenic material, a chromogenic material, and a radiolabeled isotope.

42. A process for determining the presence of a yeast cell wall component in a sample, said process comprising:

- providing a sample;
- conducting an immunological assay on said sample wherein said assay detects the presence of a compound selected from the group consisting of (1→4)-α-D-glucan, (1→6)-β-D-glucan, and (1→4)-α-/(1→6)-β-D-glucan; and
- communicating the results of said assay.

43. The process of claim 42, wherein said sample is derived from a substance selected from the group consisting of livestock feed, companion animal feed, feedstuff, Total Mixed Ration (TMR), forage, feed pellet, feed concentrate, feed premix coproduct, grain, distiller grain, molasses, fiber, fodder, grass, hay, kernel, leaves, meal, soluble feed, feed supplement, and manufacturing intermediates thereof.