CLAIMS

1. A method of producing a food or malt-based beverage ingredient, or a food or a malt-based beverage, the method comprising

(i) processing barley grain comprising 50 ppm or less hordeins to produce malt, wort, flour or wholemeal, and/or

(ii) mixing barley grain, or malt, wort, flour or wholemeal produced from said grain, with at least one other food or beverage ingredient,

wherein the barley grain, malt, wort, flour or wholemeal comprises 50 ppm or less hordeins, thereby producing the food or malt-based beverage ingredient, food or malt-based beverage,

and wherein

- the grain is homozygous for an allele of the *Hor2* locus where most or all of the B-hordein encoding genes have been deleted, or wherein the malt, wort, flour or wholemeal produced from said grain comprises DNA which comprises the allele of the *Hor2* locus where most or all of the B-hordein encoding genes have been deleted,
- the grain is homozygous for a null allele of the gene encoding D-hordein at the *Hor3* locus, or wherein the malt, wort, flour or wholemeal produced from said grain comprises DNA which comprises the null allele of the gene encoding D-hordein, and
- the grain is homozygous for an allele at the *Lys3* locus of barley which results in the grain lacking C-hordeins, or wherein the malt, wort, flour or wholemeal produced from said grain comprises DNA which comprises the allele at the Lys3 locus.

2. The method of claim 1, wherein the grain comprises about 20 ppm or less hordeins.

3. The method of claim 1 or claim 2, wherein the grain has one or more or all of the following;

i) the average weight of the grain is 35 mg to 60 mg,

ii) at least 80% of the grain does not pass through a 2.8mm sieve,

iii) the grain is from a plant which has a harvest index of at least 40%,

iv) the grain has a length to thickness ratio of less than 5,

v) the grain is from a plant which has at least 60% of the grain yield when compared to grain from a corresponding wild-type barley plant,

vi) the average weight of the grain is at least 70% of grain from a corresponding wild-type barley plant, and

vii) the grain is from a non-transgenic plant.

4. The method of claim 1, wherein the flour or wholemeal produced from the grain comprises 10 ppm or less hordeins.

5. The method of claim 1, wherein the malt or wort produced from the grain comprises less than 20 ppm hordeins.

6. The method according to any one of claims 1 to 5, wherein the grain, or malt, wort, flour or wholemeal produced from said grain is lacking one or more than one or all of:

i) B-hordeins comprising a sequence of amino acids provided as SEQ ID NO:53,

ii) B-hordeins comprising a sequence of amino acids provided as SEQ ID NO:54,

iii) C-hordeins comprising a sequence of amino acids provided as SEQ ID NO:55, and

iv) D-hordeins comprising a sequence of amino acids provided as SEQ ID NO:56.

7. The method according to any one of claims 1 to 6, wherein the B-hordeins are at least B1-hordein and B3-hordein.

8. The method according to any one of claims 1 to 7, wherein the grain, or malt, wort, flour or wholemeal produced from said grain, further has a level of less than 2% of a wild-type level of:

i) γ-hordeins comprising a sequence of amino acids provided as SEQ ID NO:57, and/or

ii) avenin-like A proteins comprising a sequence of amino acids provided as SEQ ID NO:52,

wherein the level of less than 2% is relative to a wild-type barley grain, or malt, wort, flour or wholemeal produced from said grain, of the barley variety Bomi, Sloop, Baudin, Yagan, Hindmarsh, or Commander.

9. The method according to any one of claims 1 to 8, wherein

i) the food ingredient or malt-based beverage ingredient is flour, starch, malt, or wort, or wherein the food is leavened or unleavened breads, pasta, noodles, breakfast cereals, snack foods, cakes, pastries or foods containing flour-based sauces, or

ii) the malt-based beverage is beer or whiskey.

10. A barley plant which produces grain comprising 50ppm or less hordeins, wherein

- the grain is homozygous for an allele of the *Hor2* locus where most or all of the B-hordein encoding genes have been deleted,
- the grain is homozygous for a null allele of the gene encoding D-hordein at the *Hor3* locus, and
- the grain is homozygous for an allele at the *Lys3* locus of barley which results in the grain lacking C-hordeins.

11. The barley plant of claim 10, wherein the grain comprises one or more of the features defined in claims 2 to 9.

12. Grain of a barley plant of claim 10 or claim 11.

13. A method of producing barley grain, the method comprising;

a) growing a barley plant of claim 10 or claim 11,

b) harvesting the grain, and

c) optionally processing the grain.

14. A method of producing flour, wholemeal, starch, malt, wort or other product obtained from grain, the method comprising;

a) obtaining grain of claim 12, and

b) processing the grain to produce the flour, wholemeal, starch, malt, wort or other product.

15. A product produced from a barley plant of claim 10 or claim 11, or grain of claim 12.

16. A food or malt-based beverage produced using a method according to any one of claims 1 to 9.

17. Beer comprising one or more barley grain proteins of grain according to claim 12 and less than 0.9 ppm hordeins.

18. Flour or wholemeal comprising one or more barley grain proteins of grain according to claim 12 and less than 10ppm hordeins.

19. Malt or wort comprising one or more barley grain proteins of grain according to claim 12 and less than 50 ppm hordeins.

20. Use of a food or malt-based beverage according to any one of claims 16 to 19, or a grain according to claim 12, for the manufacture of a food or beverage for orally administering to a subject to avoid or reduce the incidence or severity of coeliac's disease.