CLAIMS

What is claimed is:

1. A canola germplasm conferring on a dark canola seed the traits of high protein content as compared to a normal dark canola seed of the same species and low ADF content as compared to a normal dark canola seed of the same species, wherein the dark canola seed comprises at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3).

2. The canola germplasm of claim 1, further conferring on the dark canola seed the traits of at least 45% crude protein content and not more than 18% acid detergent fiber on an oil-free, dry mass basis.

3. A canola plant comprising the canola germplasm of claim 1.

4. The canola plant of claim 3, wherein the canola plant produces a dark canola seed having, on average, at least 45% crude protein content and not more than 18% acid detergent fiber as determined on an oil-free, dry mass basis.

5. The canola plant of claim 3, wherein the canola plant produces a dark canola seed having, on average, less than 2% erucic acid.

6. The canola plant of claim 3, wherein the canola plant produces a dark canola seed further comprising at least one additional trait selected from the group consisting of reduced polyphenolic content as compared to a normal dark canola seed of the same species and increased phosphorous content as compared to a normal dark canola seed of the same species.

7. The canola plant of claim 3, wherein the canola plant produces a dark canola seed further comprising on average, at least 45% crude protein content.

8. The canola plant of claim 3, wherein the canola plant produces a dark canola seed further comprising on average, not more than 18% acid detergent fiber as determined on an oil-free, dry mass basis.

9. The canola plant of claim 3, wherein the canola plant produces dark canola seeds having acid detergent fiber below 11% as determined on an oil-free, dry matter basis.

10. The canola plant of claim 3, wherein the canola plant produces dark canola seeds comprising at least 43% oil.

11. The canola plant of claim 3, wherein the canola plant produces dark canola seeds comprising at least 45% protein.

12. The canola plant of claim 3, wherein the canola plant produces dark canola seeds comprising at least 43% oil and at least 44% protein on an oil-free, dry matter basis.

13. A field comprising the canola plants of claim 3, wherein the canola plants yield an average of at least 1700 kilograms of seed per hectare.

14. The canola plant of claim 3, wherein the canola plant is selected from the group consisting of CL065620, CL044864, CL121460H, CL166102H, and CL121466H.

15. The canola plant of claim 3, wherein the canola plant was produced without genetic engineering and without mutagenesis.

16. The canola plant of claim 3, wherein the canola plant produces dark canola seeds having reduced antinutritional components as compared to a normal dark canola seed of the same species.

17. The canola plant of claim 3, wherein the canola plant produces a dark canola seed comprising a phosphorous content of more than 1.3% on an oil-free, dry matter basis.

18. A dark canola seed which is genetically stable for having the traits of high protein content as compared to a normal dark canola seed of the same species and low ADF content as compared to a normal dark canola seed of the same species, and having, on average, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3).

19. The dark canola seed of claim 18, wherein the dark canola seed is genetically stable for having, on average, at least 45% crude protein content, and not more than 18% acid detergent fiber as determined on an oil-free, dry matter basis.

20. The dark canola seed of claim 18, further comprising on average, at least 45% crude protein content.

21. The dark canola seed of claim 18, further comprising on average, not more than 18% acid detergent fiber content.

22. The dark canola seed of claim 18, wherein the dark canola seed is genetically stable for comprising at least one additional trait selected from the group consisting of reduced polyphenolic content as compared to a normal dark canola seed of the same species and increased phosphorous content as compared to a normal dark canola seed of the same species.

23. A method of introducing into a canola cultivar at least one desired trait selected from the group consisting of high protein content as compared to a normal dark canola seed of the same species, low ADF content as compared to a normal dark canola seed of the same species, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3), wherein the method comprises:

crossing the canola plant of claim 3 with a plant of a second, different canola cultivar to produce F1 progeny canola plants;

selecting one or more progeny canola plants that have the desired trait(s) to produce selected progeny canola plants;

backcrossing the selected progeny canola plants with the canola plant of claim 3 to produce backcross progeny canola plants;

selecting for backcross progeny canola plants that have the desired trait(s) and physiological and morphological characteristics of the second, different canola cultivar to produce selected backcross progeny canola plants; and

repeating the backcrossing and selection steps three or more times to produce inbred selected fourth or higher backcross progeny canola plants that comprise the desired trait(s).

24. The method according to claim 23, wherein the desired traits comprise dark canola seeds having at least 45% crude protein content and not more than 18% acid detergent fiber as determined on an oil-free, dry matter basis, and, on average, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3).

25. A dark canola meal obtainable from a dark canola seed, wherein the dark canola seed comprises at least 45% crude protein content and not more than 18% acid detergent fiber as determined on an oil-free, dry matter basis, and on average, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3).

26. The dark canola meal of claim 25, comprising on average, at least 49% crude protein content.

27. The dark canola meal of claim 25, comprising on average, not more than 18% acid detergent fiber content.

28. The dark canola meal of claim 25, wherein the dark canola seed is genetically stable for comprising at least one additional trait selected from the group consisting of reduced polyphenolic content as compared to a normal canola meal

produced from normal non pure-yellow canola seed of the same species and increased phosphorous content as compared to a normal canola meal produced from normal non pure-yellow canola seed of the same species.

29. The dark canola meal of claim 25, wherein the dark canola seed further comprises reduced levels of antinutritional factors as compared to a normal canola meal produced from normal non pure-yellow canola seed of the same species.

30. The dark canola meal of claim 25, wherein the dark canola meal may replace other, different, conventional canola meal or soybean meal as a protein or energy supplement in the diet of ruminants, swine, or poultry.

31. The dark canola meal of claim 25, wherein the dark canola meal has a mean true metabolizable energy of at least 2400 kcal/kg.

32. The dark canola meal of claim 25, wherein the dark canola meal has a favorable amino acid digestibility profile.

33. The dark canola meal of claim 25, wherein the dark canola meal comprises an amino acid digestibility at least 90% of that of soybean meal (10% moisture content).

34. The dark canola meal of claim 25, wherein the dark canola meal comprises a digestible energy content or a metabolizable energy content at least 80% of that of soybean meal.

CLAIMS

What is claimed is:

1. A canola germplasm conferring on a canola seed the traits of high protein content and low ADF content, wherein the canola plant produces a seed having at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3).

2. The canola germplasm of claim 1, conferring on a canola seed the further trains of at least about 45% crude protein content and not more than about 18% acid detergent fiber on an oil-free, dry mass basis.

3. A canola plant comprising the canola germplasm of claim 1.

4. The canola plant of claim 3, wherein the canola plant produces a seed having, on average, at least about 45% crude protein content and not more than about 18% acid detergent fiber as determined on an oil-free, dry mass basis.

5. The canola plant of claim 3, wherein the canola plant produces a seed having, on average, less than 2% erucic acid.

6. The canola plant of claim 3, further comprising at least one additional trait selected from the group consisting of reduced polyphenolic content and increased phosphorous content.

7. The canola plant of claim 3, further comprising on average, at least about 45% crude protein content.

8. The canola plant of claim 3, further comprising on average, not more than about 18% acid detergent fiber as determined on an oil-free, dry mass basis.

9. The plant of claim 3, wherein said seeds have acid detergent fiber below 11% as determined on an oil-free, dry matter basis.

10. The plant of claim 3, wherein said seeds comprise at least 43% oil.

11. The plant of claim 3, wherein said seeds comprise at least 45% protein.

12. The plant of claim 3, wherein said seeds comprise at least 43% oil and at least 44% protein on an oil-free, dry matter basis.

13. A field comprising plants of claim 3, wherein the plants yield an average of at least 1700 kilograms of seed per hectare.

14. The plant of claim 3, wherein the plant is selected from the group consisting of CL065620, CL044864, CL121460H, CL166102H, and CL121466H.

15. The plant of claim 3, wherein the plant was produced without genetic engineering and without mutagenesis.

16. The plant of claim 3, wherein the seeds have reduced antinutritional components.

17. The plant of claim 3, wherein the canola plant produces a seed comprising a phosphorous content of morethan 1.3% on an oil-free, dry matter basis

18. A seed produced by the canola plant of claim 3 through 12, and 14 through 17.

19. A progeny plant grown from the seed of claim 18.

20. A progeny plant of claim 19, wherein the progeny plant produces seeds having, on average, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3), and the traits of high protein content and low ADF content,

21. The progeny plant of claim 20, wherein the progeny plant produces seeds having at least about 45% crude protein content and not more than about 18% ADF as determined on an oil-free, dry matter basis

22. Canola meal produced from one or more of the seeds of claim 18.

23. The canola meal of claim 22, wherein the meal has a mean true metabolizable energy of at least 2400 kcal/kg.

24. The canola meal of claim 23, wherein the meal has a favorable amino acid digestibility profile.

25. The canola meal of claim 22, wherein said canola meal comprises an amino acid digestibility at least about 90% of that of soybean meal (10% moisture content).

26. The canola meal of claim 22, wherein said canola meal comprises a digestible energy content or a metabolizable energy content at least about 80% of that of soybean meal.

27. A canola seed which is genetically stable for having the traits of high protein content and low ADF content, and having, on average, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3).

28. The canola seed of claim 27, wherein the canola seed is genetically stable for having, on average, at least about 45% crude protein content, and not more than about 18% acid detergent fiber as determined on an oil-free, dry matter basis.

29. The canola seed of claim 27, further comprising on average, at least about 45% crude protein content.

30. The canola seed of claim 27, further comprising on average, not more than about 18% acid detergent fiber content.

31. The canola seed of claim 27, wherein the canola seed is genetically stable for comprising at least one additional trait selected from the group consisting of reduced polyphenolic content and increased phosphorous content.

32. Canola meal produced from seeds of claims 18 and 27 through 31.

33. A method of introducing into a canola cultivar at least one desired trait selected from the group consisting of high protein content, low ADF content, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3) in a seed coat color-independent manner, wherein the method comprises:

crossing the plant of claim 2 with a plant of a second, different canola cultivar to produce F1 progeny plants;

selecting one or more progeny plants that have the desired trait(s) to produce selected progeny plants;

backcrossing the selected progeny plants with the plant of claim 2 to produce backcross progeny plants;

selecting for backcross progeny plants that have the desired trait(s) and physiological and morphological characteristics of the second, different canola cultivar to produce selected backcross progeny plants; and

repeating the backcrossing and selection steps three or more times to produce inbred selected fourth or higher backcross progeny plants that comprise the desired trait(s).

34. The method according to claim 33, wherein the desired traits comprise seeds having at least about 45% crude protein content and not more than about 18% acid detergent fiber as determined on an oil-free, dry matter basis, and, on average, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3).

35. A plant produced by the method according to claim 33.

36. A plant commodity product obtained from the plant of claims 3 through 12, 14 through 17, or 35.

37. An enhanced canola meal obtainable directly from a canola seed comprising at least about 45% crude protein content and not more than about 18% acid detergent fiber as determined on an oil-free, dry matter basis, on average, at least 68% oleic acid (C18:1) and less than 3% linolenic acid (C18:3).

38. The enhanced canola meal of claim 37, further comprising on average, at least about 49% crude protein content.

39. The enhanced canola meal of claim 37, further comprising on average, not more than about 18% acid detergent fiber content.

40. The enhanced canola meal of claim 37, wherein the canola seed is genetically stable for comprising at least one additional trait selected from the group consisting of reduced polyphenolic content and increased phosphorous content.

41. The enhanced canola meal of claim 37, wherein said canola seed further comprises reduced levels of antinutritional factors.

42. The enhanced canola meal of claim 37, wherein said enhanced canola meal may replace other, different, conventional canola meal or soybean meal as a protein or energy supplement in the diet of ruminants, swine, or poultry.