CLAIMS

What is claimed is:

1. An animal feed composition comprising a human diet equivalent, the human diet equivalent consisting of 45- 53% by wet weight carbohydrates, 1- 4% by wet weight total dietary fiber, 20- 25% by wet weight fat, 7- 9% total saturated fatty acids of fat, 83- 88 mg cholesterol/100g total human diet equivalent (TD), 19- 23% by wet weight protein, 800- 1000 mg sodium/100g TD, 300- 500 mg potassium/100g TD, 4- 8% by wet weight moisture, and 4.6- 4.9 kcal/g TD; wherein the human diet equivalent is made from a defined ratio of eight food groups, the eight food groups consisting of food items identified by the first three or four digits of an eight digit food code as represented in Table A, wherein (a) milk and milk products have a food code with a first digit of 1 and are 5- 25% by wet weight; (b) meat, poultry, fish, egg, nuts, seeds, and legumes have a food code with a first digit selected from the group consisting of 2, 3, and 4 and are 10- 25% by wet weight; (c) grain products have a food code with a first digit of 5 and are 10- 20% by wet weight; (d) fruits have a food code with a first digit of 6 and are 0- 1% by wet weight; (e) vegetables have a food code with a first digit of 7 and are 0- 1% by wet weight; (f) fats and oils have a food code with a first digit of 8 and are 0.5-5.0% by wet weight; (g) sugars and sweets have a food code with a first digit of 9 and a second digit of 1 and are 0.5-5.0% by wet weight; and (h) beverages have a food code with a first digit of 9 and a second digit of 2 or 3 and are 10-60% by wet weight.

2. The composition of claim 1, wherein milk and milk products are 18.9% by wet weight; meat, poultry, fish, egg, nuts, seeds, and legumes are 18.0% by wet weight; grain products are 16.3% by wet weight; (d) fruits are 0% by wet weight; vegetables are 0.8% by wet weight; fats and oils are 0.6% by wet weight; sugars and sweets are 1.2% by wet weight, and beverages are 44.2% by wet weight.

3. The composition of any one of the preceding claims, the composition of claim 1, wherein the food items are blended into a homogenous mixture.

4. The composition of any one of the preceding claims, wherein the composition is processed into a granule form or a pellet form.

5. An animal feed composition comprising a human diet equivalent, the human diet equivalent consisting of 57- 64% by wet weight carbohydrates, 3- 7% by wet weight total dietary fiber, 10- 15% by wet weight fat, 2.0- 3.5% total saturated fatty acids of fat, 35-40 mg cholesterol/100g human diet equivalent TD, 13- 17% by wet weight protein, 300- 500 mg sodium/100g TD, 500- 700 mg potassium/100g TD, 4-8% by wet weight moisture, and 4.0- 4.4 kcal/g TD; wherein the human diet equivalent is made from a defined ratio of eight food groups, the eight food groups consisting of food items identified by the first three or four digits of an eight digit food code as represented in Table A, wherein (a) milk and milk products have a food code with a first digit of 1 and are 5- 25% by wet weight, (b) meat, poultry, fish, egg, nuts, seeds, and legumes have a food code with a first digit selected from the group consisting of 2, 3, and 4 and are 10- 25% by wet weight, (c) grain products have a food code with a first digit of 5 and are 10- 20% by wet weight, (d) fruits have a food code with a first digit of 6 and are 10- 25% by wet weight fruits, (e) vegetables have a food code with a first digit of 7 and are 10- 25% by wet weight, (f) fats and oils have a food code with a first digit of 8 and are 0.5- 5% by wet weight, (g) sugars and sweets have a food code with a first digit of 9 and a second digit of 1 and are 0.5- 5% by wet weight sugars and sweets, and (h) beverages have a food code with a first digit of 9 and a second digit of 2 or 3 and are 10- 60% by wet weight .

6. The composition of claim 5, wherein the milk and milk products are 10.2% by wet weight; meat, poultry, fish, egg, nuts, seeds, and legumes are 15.7% by wet weight; grain products are 12.7% by wet weight; fruits are 19.5% by wet weight; vegetables are 18% by wet weight; fats and oils are 0.9% by wet weight; sugars and sweets are 0.6% by wet weight; and beverages are 22.2% by wet weight.

7. The composition of claim 5 or claim 6, wherein the composition is processed into a granule form or a pellet form.

8. The composition of any one of claims 5 to 7, wherein the food items are blended into a homogenous mixture.

9. A process to prepare pelletized animal feed, comprising the composition according to any one of the preceding claims, the process comprising

(i) introducing two or more food items independently selected from the group consisting of frozen food items, refrigerated food items, and room temperature food items into a first mixer and blending the food items, wherein the first mixer is a high shear liquid mixer;

(ii) passing and/or recirculating the blended food items into a second mixer to form a homogenous composite, wherein the second mixer is a rotor-stator mixer and the homogenized composite is evenly blended by visual inspection;

(iii) freeze drying the homogenous composite and milling the dehydrated composite to a 20 mesh size, wherein the moisture content of the dehydrated composite is less than 5%;

(iv) adding water to the milled composite and extruding into pellets, wherein the moisture content of the composite at the end of the extrusion process is less than 10%.

10. The process of claim 9, wherein dehydrated composite is a freeze dried composite with a moisture content of less than 2.7%.

11. The process of claim 9 or claim 10, wherein the moisture content of the extruded pellet is less than 7%.

12. The process of any one of claims 9 to 11, wherein the total processing time of steps (i) and (ii) does not exceed two hours.

13. The process of any one of claims 9 to 12, wherein the pellets are packaged and sterilized by gamma irradiation.

14. The process of any one of claims 9 to 12, wherein the pellets are sterilized by gamma irradiation and packaged.

15. The process of any one of claims 9 to 14, wherein the frozen, refrigerated and room temperature food items consist of eight food groups in a defined ratio, the eight food groups consisting of food items identified by the first three or four digits of an eight digit food code as represented in Table A, wherein (a) milk and milk products have a food code with a first digit of 1 and are 5- 25% by wet weight; (b) meat, poultry, fish, egg, nuts, seeds, and legumes have a food code with a first digit selected from the group consisting of 2, 3, and 4 and are 10- 25% by wet weight; (c) grain products have a food code with a first digit of 5 and are 10- 20% by wet weight; (d) fruits have a food code with a first digit of 6 and are 0- 1% by wet weight; (e) vegetables have a food code with a first digit of 7 and are 0- 1% by wet weight; (f) fats and oils have a food code with a first digit of 8 and are 0.5-5.0% by wet weight; (g) sugars and sweets have a food code with a first digit of 9 and a second digit of 1 and are 0.5-5.0% by wet weight; and (h) beverages have a food code with a first digit of 9 and a second digit of 2 or 3 and are 10-60% by wet weight.;

16. The process of any one of claims 9 to 14, wherein the frozen, refrigerated and room temperature food items consist of eight food groups in a defined ratio, the eight food groups consisting of food items identified by the first three or four digits of an eight digit food code as represented in Table A, wherein (a) milk and milk products have a food code with a first digit of 1 and are 5- 25% by wet weight, (b) meat, poultry, fish, egg, nuts, seeds, and legumes have a food code with a first digit selected from the group consisting of 2, 3, and 4 and are 10- 25% by wet weight, (c) grain products have a food code with a first digit of 5 and are 10- 20% by wet weight, (d) fruits have a food code with a first digit of 6 and are 10- 25% by wet weight fruits, (e) vegetables have a food code with a first digit of 7 and are 10-25% by wet weight, (f) fats and oils have a food code with a first digit of 8 and are 0.5- 5% by wet weight, (g) sugars and sweets have a food code with a first digit of 9 and a second digit of 1 and are 0.5- 5% by wet weight sugars and sweets, and

(h) beverages have a food code with a first digit of 9 and a second digit of 2 or 3 and are 10- 60% by wet weight.

17. The process of any one of claims 9 to 16 further comprising adding a dietary supplement, wherein a dietary supplement may be added during step (i), step (ii), after step (iii) but prior to step (iv).

18. The process of any one of claims 9 to 16 further comprising adding a dietary supplement, wherein a dietary supplement is added to a milled composite of step (iii) prior to processing into a final form.

19. A method of determining the effect of at least one dietary supplement on a subject, the method comprising administering or feeding a composition of any of the claims 1 through 8 further comprising at least one dietary supplement to a subject and determining the presence or absence of a difference in the subject after administering the composition comprising the dietary supplement, wherein the difference is measured as a change in gut microbiota, a change in weight, a change in body fat, a change in energy consumption, a change in health, a change in inflammation, a change in immune function and/or a change in metabolism, and, wherein the presence or absence of a difference in the subject represents the effect of the dietary supplement on the subject.

20. A method of determining the effect of at least one dietary supplement on a subject, the method comprising (1) administering or feeding a first composition to a subject for a first period of time, wherein the first composition is a composition of any of the claims 1 through 8, (2) administering or feeding a second composition to the subject for a second period of time, wherein the second composition consists of the first composition and at least one dietary supplement, and (3) determining the presence or absence of a difference in the subject after administering or feeding the second composition, wherein the difference is measured as a change in gut microbiota, a change in weight, a change in body fat, a change in energy consumption, a change in health, a change in inflammation, a change in immune function and/or a change in metabolism, and wherein the presence or absence of

a difference in the subject represents the effect of the dietary supplement on the subject.

21. A method of determining the effect of at least one dietary supplement on a subject, the method comprising (1) administering or feeding a first composition to a subject for a first period of time, wherein the first composition is a composition of any of the claims 1 through 8 and at least one dietary supplement, (2) administering or feeding a second composition to the subject for a second period of time, wherein the second composition consists of the first composition without the at least one dietary supplement, and (3) determining the presence or absence of a difference in the subject after administering or feeding the second composition, wherein the difference is measured as a change in gut microbiota, a change in weight, a change in body fat, a change in energy consumption, a change in health, a change in inflammation, a change in immune function and/or a change in metabolism, and wherein the presence or absence of a difference in the subject represents the effect of the dietary supplement on the subject.

22. The method of claim 19, 20, or 21, wherein the dietary supplement is high in non-digestible carbohydrates and antioxidants.