CLAIMS:

1. A machine for food waste processing, comprising:

a power supply;

a control system coupled to the power supply;

a mixing drum defining a mixing chamber and having a volumetric capacity of 2000 litres or less;

a mixing shaft having mixing blades extending from the mixing shaft, the mixing shaft being configured to rotate to move the mixing blades within the mixing chamber;

an ioniser coupled to the power supply and arranged to provide a source of air that is rich in reactive oxygen species;

a heater and a fan coupled to the power supply and arranged to receive the source of air, the heater and fan cooperating to provide a source of heated gas rich in ionised oxygen to the mixing chamber, wherein the heated gas is between about 50 and about 70 degrees C and/or wherein the environment in the processing drum is heated to a temperature in the range of 50 to 70 degrees C;

a motor arranged to draw power from the power supply and to drive rotation of the mixing shaft;

wherein the mixing drum defines an input aperture to receive food waste and an outlet to disgorge processed waste residue;

wherein the control system is configured to operate the motor to drive the mixing shaft for multiple hours while monitoring operating parameters of the machine in order to produce a processed waste residue, wherein the residue comprises or consists essentially of substantially dried particulate.

2. The machine of claim 1, wherein the control system is configured to monitor the power draw of the motor and to determine a time of peak power draw of the motor.

3. The machine of claim 1 or 2, wherein the control system is configured to determine that the processed waste residue is ready for disgorgement from the outlet based on one or more process completion conditions.

4. The machine of claim 3, wherein the one or more completion conditions include a predetermined time elapsing after the time of peak power draw.

5. The machine of claim 4, wherein the predetermined time is between about 4 hours and about 7 hours.

6. The machine of any one of claims 3 to 5, wherein the machine comprises a humidity sensor to sense humidity in the mixing chamber, and wherein the one or more completion conditions include a humidity level in the mixing chamber being below a humidity threshold.

7. The machine of any one of claims 3 to 6, wherein the machine comprises a temperature sensor to sense air temperature in the mixing chamber or at an exhaust outlet of the mixing drum, and wherein the one or more completion conditions include a sensed temperature level of the temperature sensor being within a predetermined temperature range.

8. The machine of any one of claims 1 to 7, wherein the outlet is disposed in an outer wall of the drum at a position that is vertically above a position of the mixing shaft.

9. The machine of any one of claims 1 to 8, wherein the mixing shaft has at least one scoop coupled thereto, the at least one scoop being configured to carry processed waste residue to the position of the outlet.

10. The machine of claims 1 to 9, wherein the control system is configured to automatically initiate disgorgement of processed waste residue in response to determining that the processed waste residue is ready for disgorgement.

11. The machine of claim 10, wherein the control system monitors a weight of the drum during disgorgement to monitor the weight of disgorged residue and to determine the weight

of residue remaining in the drum, wherein the control system is configured to cease disgorgement of processed waste residue when the weight of residue remaining in the drum reaches a predetermined minimum threshold level, whereby an amount of at least 20 kg of processed waste residue remains in the drum after disgorgement ceases.

12. The machine of claim 11, wherein at least 50 kg of processed waste residue remains in the drum after disgorgement ceases.

13. The machine of claim 11, wherein at least 100 kg of processed waste residue remains in the drum after disgorgement ceases.

14. A process for rapid food waste decomposition, comprising:

loading a mass of food waste into a processing chamber defined by a processing drum of a waste processing machine that comprises a shaft and a plurality of blades coupled to the shaft and extending away from the shaft;

rotating the shaft to cause the blades to break down food waste present in the processing drum;

supplying heated air into the processing drum while the shaft is rotating, wherein the environment in the processing drum is heated to a temperature in the range of 50 to 70 degrees Celsius and/or wherein the heated air is supplied at a temperature of between about 50 to about 70 degrees Celsius,

wherein the heated air is rich in radicalised and/or ionised oxygen;

extracting air from the drum to remove airborne moisture from the drum;

monitoring processing conditions relating to the processing drum while the shaft is rotating;

determining that the processing conditions satisfy process completion criteria; and

removing residue of the processed food waste from the processing chamber;

wherein when the completion criteria are satisfied, the moisture content of the residue is about 30% or less.

15. The process of claim 14, wherein the removing is controlled in order to leave a minimum weight of residue in the processing drum.

16. The process of claim 15, wherein the removing comprises transferring the residue into a hatch in an end wall of the drum.

17. The process of claim 15 or claim 16, wherein the minimum weight of residue is determined as the greater of: a predetermined percentage of the total weight of organic material in the drum at the time of loading the mass of food waste into the processing drum; or a preset minimum weight.

18. The process of claim 16, wherein the hatch is disposed at a level that is vertically above the level of the shaft.

19. The process of claim 18, wherein the transferring comprises elevating the residue to the level of the hatch.

20. The process of claim 18 or claim 19, wherein the transferring comprises scooping residue into the hatch using at least one of the blades or a scoop coupled to the shaft.

21. The process of any one of claims 14 to 20, wherein the processing conditions comprise at least one of: power draw of a motor driving the shaft; peak power draw of a motor driving the shaft; air temperature inside the processing chamber; humidity of air inside the processing chamber; elapsed time since a time at which the last mass of food waste was loaded into the processing chamber; a current weight of residue in the processing chamber relative to a starting weight of loaded food waste at the time at which the last mass of food waste was loaded into the processing chamber; a percentage weight reduction of the loaded food waste.

22. The process of any one of claims 14 to 21, further comprising monitoring power draw of a motor driving rotation of the shaft over time to determine a time of peak power draw over a processing period.

23. The process of claim 22, wherein the monitoring power draw comprises setting a beginning of the processing period as the time at which the last mass of food waste was loaded into the processing chamber.

24. The process of claim 22 or claim 23, further comprising resetting the beginning of the processing period in response to determining that a further mass of food waste has been loaded into the processing chamber.

25. The process of any one of claims 14 to 24, further comprising monitoring an open or closed status of a loading hatch of the waste processing machine.

26. The process of any one of claims 14 to 25, further comprising monitoring an output of load sensors coupled to the processing drum to determine a weight of the mass of food waste loaded into the processing chamber.

27. The process of any one of claims 14 to 26, wherein removing the residue comprises continuing to rotate the shaft and discontinuing supplying the heated air.

28. The process of any one of claims 14 to 27, wherein when the completion criteria are satisfied, the weight of the loaded mass of food waste is reduced by between about 50% and 90%.

29. The process of claim 28, wherein when the completion criteria are satisfied, the weight of the loaded mass of food waste is reduced by between about 60% and 90%.

30. The process of claim 28, wherein when the completion criteria are satisfied, the weight of the loaded mass of food waste is reduced by between about 70% and 90%.

31. The process of claim 14, wherein when the completion criteria are satisfied, the moisture content of the residue is between about 30% and about 10%.