CLAIMS

The invention is claimed as follows:

1. A method for mixing a food product, the method comprising:

providing a food product;

acoustically mixing the food product with an acoustic mixing device while thermally processing the food product~~.~~ with a rate of change in force direction within a range between 5 Hz to 1000 Hz.

2. The method according to Claim 1, wherein the acoustic mixing provides accelerations in the food product up to about 150 g.

3. The method according to Claim 1, wherein the acoustic mixing provides a rate of change in force direction in the food product of at least 20 Hz.

4. The method according to Claim 1, wherein the food product comprises particulates.

5. The method according to Claim 1, wherein the food product is substantially homogenous.

6. The method according to Claim 1, wherein the food product comprises a high viscosity.

7. The method according to Claim 1, wherein the thermal processing is selected from the group consisting of heating, cooling, and combinations thereof.

8. A method for manufacturing a shelf-stable food product, the method comprising:

acoustically mixing the food product with an acoustic mixing device during thermal processing of the food product~~.~~ with a rate of change in force direction within range between 5Hz to 1000 Hz.

9. The method according to Claim 8, wherein the acoustic mixing provides accelerations in the food product up to about 150 g.

10. The method according to Claim 8, wherein the mixing the food product with an acoustic mixing device comprises: providing a thermal processing vessel comprising a product vessel so constructed and arranged to be sealingly housed by an outer vessel;

filling at least a portion of the product vessel with a food product; and

simultaneously thermally processing and acoustically mixing the food product in the thermal processing vessel.

11. The method according to Claim ~~9~~10, further comprising filling at least a portion of the outer vessel with a heating or cooling medium.

12. The method according to Claim ~~9~~10, further comprising sealing the product vessel within the outer vessel such that there is no fluid transfer between the product vessel and the outer vessel.

13. The method according to Claim 9, wherein the food product comprises particulates.

14. The method according to Claim 9, wherein the food product is substantially homogenous.

15. The method according to Claim 9, wherein the food product comprises a high viscosity.

16. The method according to Claim 8, further comprising mixing the food product to achieve a substantially uniform temperature of a food product during heating or cooling of the food product.

17. The method according to Claim ~~16~~8, wherein an amount of time required to provide a substantially uniform temperature of a food product during heating or cooling of the food product is reduced compared to other methods outside of the scope of claim 8.

18. The method according to Claim 8, wherein the food product is thermally sterilized.

19. The method according to Claim 8, wherein the food product is thermally pasteurized.

20. The method according to Claim 8, wherein an amount of time required to thermally sterilize a food product is reduced compared to other methods outside of the scope of claim 8.

21. The method according to Claim 8, wherein an amount of time required to thermally pasteurize a food product is reduced compared to other methods outside of the scope of claim 8.

22. The method according to Claim 8, wherein the amount of stagnant product on an interior wall of a product vessel is reduced compared to other methods outside of the scope of claim 8.