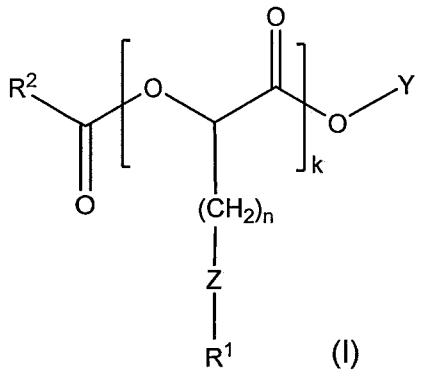
13. The feed composition of any one of claims 8 to 12, further comprising at least one agent chosen from an essential oil, a metal chelate, a mineral, an amino acid, an organic acid, a vitamin, an antioxidant, a polyunsaturated fatty acid, a prebiotic, a probiotic, a symbiotic, an enzyme, an ionophore, a mycotoxin binder, an antiparasitic agent, an antibiotic, a herbal extract, a pigment, an excipient, or combination thereof.

14. The feed composition of any one of claims 8 to 13, wherein the feed composition is part of a feed premix, grain mix, feed blend, pet food, or pet treat.

15. The feed composition of any one of claims 8 to 14, wherein the feed composition is for swine, poultry, ruminants, companion animals, or aquatic organisms.

16. An *in vitro* method for inhibiting the growth of at least one microbe, the method comprising contacting the microbe with an effective amount of at least one compound of Formula (I):



(I)

wherein:

R^1 is hydrocarbyl or substituted hydrocarbyl;

R^2 is hydrocarbyl or substituted hydrocarbyl;

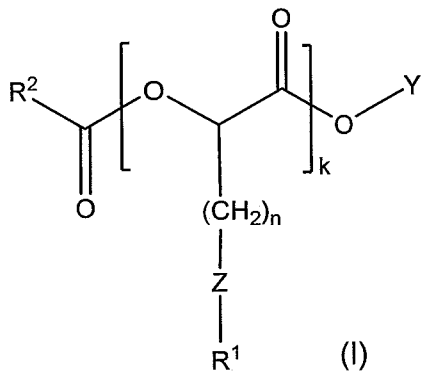
Y is a cation chosen from hydrogen, ammonium, an alkali metal, an alkaline earth metal, or a transition metal;

Z is sulfur or selenium;

k is an integer of 1 or greater; and

n is an integer of 1 or greater.

17. Use of at least one compound in the manufacture of a medical composition for inhibiting the growth of at least one microbe, wherein the compound comprises Formula (I):



(I)

wherein:

R^1 is hydrocarbyl or substituted hydrocarbyl;

R^2 is hydrocarbyl or substituted hydrocarbyl;

Y is a cation chosen from hydrogen, ammonium, an alkali metal, an alkaline earth metal, or a transition metal;

Z is sulfur or selenium;

k is an integer of 1 or greater; and

n is an integer of 1 or greater.

18. The method of claim 16 or the use of claim 17, wherein R^1 is alkyl, substituted alkyl, alkenyl, substituted alkenyl, aryl or substituted aryl, and R^2 is alkyl, substituted alkyl, alkenyl, substituted alkenyl, aryl or substituted aryl.

19. The method of claims 16 or 18 or the use of claims 17 or 18, wherein R^1 is C_1-C_6 alkyl, and R^2 is C_4-C_{24} alkyl or C_4-C_{24} alkenyl, k is from 1 to 10, and n is from 1 to 3.

20. The method of any one of claims 16, 18 to 19 or the use of any one of claims 17 to 19, wherein R^1 is methyl, R^2 is C_4-C_{16} alkyl, Y is hydrogen or an alkali metal, Z is sulfur, and n is 2.

21. The method of any one of claims 16, 18 to 20 or the use of any one of claims 17 to 20, wherein the microbe is a gram positive bacterium.

22. The use of any one of claims 17 to 21, wherein the microbe is within an alimentary canal organ or on a surface of a subject.

23. The use of claim 22, wherein the compound of Formula (I) is to be administered orally to the subject.

24. The use of claim 23, wherein the compound of Formula (I) is to be applied topically to the subject.

25. The method of claim 16 or the use of claims 23 or 24, wherein the compound of Formula (I) is part of a composition.

26. The method of claim 16 or the use of claim 25, wherein the composition further comprises at least one agent chosen from an essential oil, a metal chelate, a mineral, an amino acid, an organic acid, a vitamin, an antioxidant, a polyunsaturated fatty acid, a prebiotic, a probiotic, a symbiotic, an enzyme, an ionophore, a mycotoxin binder, an antiparasitic agent, an antibiotic, a herbal extract, a pigment, or combination thereof.

27. The use of claim 23, wherein the compound of Formula (I) is part of a feed composition.

28. The use of claim 27, wherein the feed composition comprises at least one nutritive agent chosen from a carbohydrate source, a fat source, a protein source, an amino acid, an alpha hydroxy acid, or combination thereof.

29. The use of claim 28, wherein the feed composition further comprises at least one agent chosen from an essential oil, a metal chelate, a mineral, an amino

acid, an organic acid, a vitamin, an antioxidant, a polyunsaturated fatty acid, a prebiotic, a probiotic, a symbiotic, an enzyme, an ionophore, a mycotoxin binder, an antiparasitic agent, an antibiotic, a herbal extract, a pigment, or combination thereof.

30. The use of any one of claims 23 to 29, wherein the subject exhibits improved gut health, increased feed efficiency, and/or increased performance index relative to a subject not administered the compound of Formula (I).

31. The use of any one of claims 22 to 30, wherein the subject is human, swine, poultry, ruminant, companion animal, or aquatic organism.

32. The method of any one of claims 16, 18 to 21, wherein the microbe is on a surface of an object.

33. The method of claim 32, wherein the object is food or feed, a food or feed product, food or feed preparation equipment, food or feed packing material, health care equipment, medical devices, or packaging for household, healthcare, or industrial products.