WHAT IS CLAIMED IS:

1. Use of a C_1-C_4 alkyl ester azelate in the manufacture of a pharmaceutical composition for treating or preventing a dyslipidemia or a disease or condition associated with a dyslipidemia in a subject, the pharmaceutical composition comprising a C_1-C_4 alkyl ester azelate in an amount effective to treat or prevent the dyslipidemia, or a disease or condition associated with a dyslipidemia in the subject.

2. The use of claim 1, wherein the pharmaceutical composition comprises a C_1-C_4 alkyl ester azelate in an amount effective to improve one or more abnormal lipid levels in the subject.

3. The use of claims 1-2, wherein the pharmaceutical composition comprises a C_1-C_4 alkyl ester azelate in an amount effective to lower an elevated low density lipoprotein (LDL) level, elevate a diminished high density lipoprotein (HDL) level, lower an elevated triglyceride level, lower an elevated total cholesterol to HDL ratio (cholesterol/HDL), lower an elevated LDL-to-HDL ratio (LDL/HDL), lower an elevated LDL-to-triglyceride ratio (LDL/triglyceride), or lower an elevated non-cholesterol HDL-to-HDL ratio (non-cholesterol HDL/HDL) in the subject.

4. The use of claims 1-3, wherein the dyslipidemia or disease or condition associated with the dyslipidemia comprises one or more of the following: hyperlipidemia, hypertriglyceridemia, hypercholesterolemia, mixed hyperlipidemia, familial combined hyperlipidemia, lipodystrophy, cardiovascular disease, hypertension, stroke, atherosclerosis, arteriosclerosis, coronary artery disease, NASH, ASH, fatty liver disease, NAFLD, hepatomegaly, pancreatitis, metabolic syndrome, insulin resistance, prediabetes, type II diabetes, overweight, and obesity.

5. The use of claims 1-4, wherein the pharmaceutical composition comprises a C_1-C_4 alkyl ester azelate selected from the group consisting of dimethyl azelate (DEA), dimethyl

azelate (DMA), di-isopropyl azelate (DiPA), di-isobutyl azelate (DiBuA), and di-2-pentyl azelate (D2PA).

6. The use of claims 1-5, wherein the pharmaceutical composition comprises a dosage of the C_1-C_4 alkyl ester azelate in a range from about 0.1 mg/kg/day to about 10 mg/kg/day**.**

7. The use of claims 1-6, wherein the pharmaceutical composition comprises a dosage of the C_1-C_4 alkyl ester azelate in a range from about 0.25 mg/kg/day to about 2.0 mg/kg/day

8. The use of claims 1-7, wherein the pharmaceutical composition comprises DEA.

9. The use of claims 1-8 wherein the pharmaceutical composition comprises a dosage of DEA of about 0.1 mg/kg/day, about 0.25 mg/kg/day, about 0.5 mg/kg/day, about 1 mg/kg/day, about 2 mg/kg/day, or about 4 mg/kg/day.

10. The use of claim 1, wherein the subject has; is suspected of having; or is suspected of having a predisposition to acquiring; at least one of insulin resistance, prediabetes, type II diabetes, overweight, or obesity.

11. The use of claim 1, wherein the subject has a body mass index (BMI) from 25 to less than 30 or has a BMI of 30 or greater.

12. The use of claims 1-11, wherein the pharmaceutical composition is formulated for buccal delivery of the C_1-C_4 alkyl ester azelate.

13. The use of claims 1-11, wherein the pharmaceutical composition is formulated for gastric delivery of the C_1-C_4 alkyl ester azelate.

14. The method of claims 1-11, wherein the pharmaceutical composition is formulated for parenteral delivery of the C_1-C_4 alkyl ester azelate.

15. The use of claims 1-11, wherein the pharmaceutical composition is formulated for enteral delivery of the C_1-C_4 alkyl ester azelate.

16. The use of claims 1-15, wherein the pharmaceutical composition further comprises a second active ingredient, or further comprising a second pharmaceutical composition for treating or preventing a dyslipidemia or a disease or condition associated with a dyslipidemia in a subject, the pharmaceutical comprising a second active ingredient other than the C_1-C_4 alkyl ester azelate in the first pharmaceutical composition.

17. The use of claim 16, wherein the second active ingredient comprises one or more of the following: a C_1-C_4 alkyl ester azelate other than DEA, a biguanide, metformin, buformin, phenformin, a thiazolidinedione, pioglitazone, rosiglitazone, a corticosteroid, prednisone, an insulin, a lipase inhibitor, orlistat, a glucagonlike peptide-1 (GLP-1) agonist, an exendin, exenatide, liraglutide, lixisenatide, albiglutide, dulaglutide, semaglutide, an HMG-CoA reductase inhibitor, a statin, atorvastatin, fluvastatin, lovastatin, pitavastatin, pravastatin, rusovastatin, simvastatin, a fibrate, gemfibrozil, fenofibrate, niacin, a leptin, a leptin agonist, metreleptin, an amylin agonist, pramlintide, and combinations thereof.

18. The use of claim 17, wherein the second pharmaceutical composition comprises insulin and is formulated as a rapid-acting formulation, an intermediate-acting formulation, a long-acting formulation, or combinations thereof.

19. The use of claims 1-15, wherein the pharmaceutical composition consists essentially of DEA as active ingredient

20. The use of claims 1-15, wherein the pharmaceutical composition consists of DEA as active ingredient.

21. A pharmaceutical composition comprising a C_1-C_4 alkyl ester azelate for either buccal delivery or gastric delivery, wherein the C_1-C_4 alkyl ester azelate is at a dose in a range from about 0.25 mg/mg to about 2.0 mg/kg.

22. The pharmaceutical composition of claim 21, wherein the C_1-C_4 alkyl ester azelate is selected from the group consisting of DEA, DMA, DiPA, DiBuA, and D2PA.

23. The pharmaceutical composition of claims 21 or 22, wherein the C_1-C_4 alkyl ester azelate is DEA.

24. The pharmaceutical composition of claims 21-23, wherein the dose is effective for improving one or more abnormal lipid levels when administered to a subject.

25. The pharmaceutical composition of claims 21-23, wherein the dose is effective for lowering an elevated LDL level, elevating a diminished HDL level, lowering an elevated triglyceride level, lowering an elevated cholesterol/HDL, lowering an elevated LDL/HDL, lowering an elevated LDL/triglyceride, or lowering an elevated non-cholesterol HDL/HDL when administered to a subject.

26. The pharmaceutical composition of claims 21-25, wherein the dose is effective for treating or preventing a dyslipidemia, or a disease or condition associated with a dyslipidemia, when administered to a subject.

27. The pharmaceutical composition of claims 21-26, wherein the disease or condition associated with dyslipidemia is selected from the group consisting of hyperlipidemia, hypertriglyceridemia, hypercholesterolemia, mixed hyperlipidemia, familial combined hyperlipidemia, lipodystrophy, cardiovascular disease, hypertension, stroke, atherosclerosis, arteriosclerosis, coronary artery disease, NASH, ASH, fatty liver disease, NAFLD, hepatomegaly, pancreatitis, metabolic syndrome, insulin resistance, prediabetes, type II diabetes, overweight, and obesity.

28. A kit for treating or preventing a dyslipidemia or a disease or condition associated with a dyslipidemia in a subject, the kit comprising (a) a first pharmaceutical comprising a C_1-C_4 alkyl ester azelate in an amount effective to treat or prevent the dyslipidemia, or a disease or condition associated with a dyslipidemia in the subject; and (b) a second pharmaceutical composition comprising a second active ingredient other than the C_1-C_4 alkyl ester azelate in the

first pharmaceutical composition, wherein the first and second pharmaceutical compositions are contained in separate containers.