SEQUENCE LISTING

<110> National University Of Singapore

<120> METHOD OF CONVERTING GREASE CONTAINING HIGH CONTENT OF FREE FATTY ACIDS TO FATTY ACID ESTERS AND CATALYSTS FOR USE IN SAID METHOD

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<170> PatentIn version 3.5

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<309> 2006-06-12
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aacaacaagc ttcccgtgct tacctggtcc cagggtggtc tggttgcaca gtggggtctg 420

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atcgtgccca ccaccaacct ctactcggcg accgacgaga tcgttcagcc tcaggtgtcc 660

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        35                  40                  45

Gly Ala Ser Pro Ser Ser Val Ser Lys Pro Ile Leu Leu Val Pro Gly
    50                  55                  60

Thr Gly Thr Thr Gly Pro Gln Ser Phe Asp Ser Asn Trp Ile Pro Leu
65                  70                  75                  80

Ser Thr Gln Leu Gly Tyr Thr Pro Cys Trp Ile Ser Pro Pro Pro Phe
                85                  90                  95

Met Leu Asn Asp Thr Gln Val Asn Thr Glu Tyr Met Val Asn Ala Ile
            100                 105                 110

Thr Ala Leu Tyr Ala Gly Ser Gly Asn Asn Lys Leu Pro Val Leu Thr
        115                 120                 125

Trp Ser Gln Gly Gly Leu Val Ala Gln Trp Gly Leu Thr Phe Phe Pro
    130                 135                 140

Ser Ile Arg Ser Lys Val Asp Arg Leu Met Ala Phe Ala Pro Asp Tyr
145                 150                 155                 160

Lys Gly Thr Val Leu Ala Gly Pro Leu Asp Ala Leu Ala Val Ser Ala
                165                 170                 175

Pro Ser Val Trp Gln Gln Thr Thr Gly Ser Ala Leu Thr Thr Ala Leu
            180                 185                 190

Arg Asn Ala Gly Gly Leu Thr Gln Ile Val Pro Thr Thr Asn Leu Tyr
        195                 200                 205

Ser Ala Thr Asp Glu Ile Val Gln Pro Gln Val Ser Asn Ser Pro Leu
    210                 215                 220

Asp Ser Ser Tyr Leu Phe Asn Gly Lys Asn Val Gln Ala Gln Ala Val
225                 230                 235                 240

Cys Gly Pro Leu Phe Val Ile Asp His Ala Gly Ser Leu Thr Ser Gln
                245                 250                 255
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Phe Ser Tyr Val Val Gly Arg Ser Ala Leu Arg Ser Thr Thr Gly Gln
            260                 265                 270

Ala Arg Ser Ala Asp Tyr Gly Ile Thr Asp Cys Asn Pro Leu Pro Ala
        275                 280                 285

Asn Asp Leu Thr Pro Glu Gln Lys Val Ala Ala Ala Ala Leu Leu Ala
    290                 295                 300

Pro Ala Ala Ala Ala Ile Val Ala Gly Pro Lys Gln Asn Cys Glu Pro
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gcacagtatt ctgcagccgc atactgcgga aaaaacaatg atgccccagc tggtacaaac      240

attacgtgca cgggaaatgc ctgccccgag gtagagaagg cggatgcaac gtttctctac      300

tcgtttgaag agtaagtgtc gacataagtg caggcactcg ccgtggaaat agcagactga      360

ccgggaagtg cagctctgga gtgggcgatg tcaccggctt ccttgctctc gacaacacga      420

acaaattgat cgtcctctct ttccgtggct ctcgttccat agagaactgg atcgggaatc      480

ttaacttcga cttgaaagaa ataaatgaca tttgctccgg ctgcagggga catgacggct      540

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ctgttgccgg agcagacctg cgtggaaatg ggtatgatat cgacgtggta tgtagtaaac      720

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agccattcta gcccagagta ctggatcaaa tctggaaccc ttgtccccgt cacccgaaac      960
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35 40 45

Asp Ala Pro Ala Gly Thr Asn Ile Thr Cys Thr Gly Asn Ala Cys Pro
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Glu Val Glu Lys Ala Asp Ala Thr Phe Leu Tyr Ser Phe Glu Asp Ser
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Gly Val Gly Asp Val Thr Gly Phe Leu Ala Leu Asp Asn Thr Asn Lys
85 90 95

Leu Ile Val Leu Ser Phe Arg Gly Ser Arg Ser Ile Glu Asn Trp Ile
100 105 110

Gly Asn Leu Asn Phe Asp Leu Lys Glu Ile Asn Asp Ile Cys Ser Gly
115 120 125

Cys Arg Gly His Asp Gly Phe Thr Ser Ser Trp Arg Ser Val Ala Asp
130 135 140

Thr Leu Arg Gln Lys Val Glu Asp Ala Val Arg Glu His Pro Asp Tyr
145 150 155 160

Arg Val Val Phe Thr Gly His Ser Leu Gly Gly Ala Leu Ala Thr Val
165 170 175

Ala Gly Ala Asp Leu Arg Gly Asn Gly Tyr Asp Ile Asp Val Phe Ser

180 185 190

Tyr Gly Ala Pro Arg Val Gly Asn Arg Ala Phe Ala Glu Phe Leu Thr
195 200 205

Val Gln Thr Gly Gly Thr Leu Tyr Arg Ile Thr His Thr Asn Asp Ile
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Val Pro Arg Leu Pro Pro Arg Glu Phe Gly Tyr Ser His Ser Ser Pro
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Glu Tyr Trp Ile Lys Ser Gly Thr Leu Val Pro Val Thr Arg Asn Asp
245 250 255

Ile Val Lys Ile Glu Gly Ile Asp Ala Thr Gly Gly Asn Asn Gln Pro
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gccaggcggc ataattcata aggaactgat atgggcatct ttagctataa ggatttggac 300

gaaaacgcgt cgaaagcgct gttttccgac gccttggcca tctccaccta cgcttaccac 360

aatatcgata acggcttcga cgaaggctac caccagaccg gtttcggtct tggcctgccg 420

ctgacgctga tcaccgcgct gatcggcagc acccaatcgc agggcggcct gccccgcatt 480

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Asp Asn Gly Phe Asp Glu Gly Tyr His Gln Thr Gly Phe Gly Leu Gly
        35                  40                  45

Leu Pro Leu Thr Leu Ile Thr Ala Leu Ile Gly Ser Thr Gln Ser Gln
    50                  55                  60

Gly Gly Leu Pro Arg Ile Pro Trp Asn Pro Asp Ser Glu Gln Ala Ala
65                  70                  75                  80

Gln Glu Thr Val Asn Asn Ala Gly Trp Ser Val Ile Ser Ala Ala Gln
                85                  90                  95

Leu Gly Tyr Ala Gly Lys Thr Asp Ala Arg Gly Thr Tyr Tyr Gly Glu
            100                 105                 110

Thr Ala Gly Tyr Thr Thr Ala Gln Ala Glu Val Leu Gly Lys Tyr Asp
        115                 120                 125

Ser Glu Gly Asn Leu Thr Ala Ile Gly Ile Ser Phe Arg Gly Thr Ser
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Gly Pro Arg Glu Ser Leu Ile Gly Asp Thr Ile Gly Asp Val Ile Asn
145                 150                 155                 160

Asp Leu Leu Ala Gly Phe Gly Pro Lys Gly Tyr Ala Asp Gly Tyr Thr
                165                 170                 175

Leu Asn Ala Phe Gly Asn Leu Leu Gly Asp Val Ala Lys Phe Ala Gln
            180                 185                 190

Ala His Gly Leu Ser Gly Glu Asp Val Val Val Ser Gly His Ser Leu
        195                 200                 205

Gly Gly Leu Ala Val Asn Ser Met Ala Ala Gln Ser Asp Ala Asn Trp
    210                 215                 220

Gly Gly Phe Tyr Ala Gln Ser Asn Tyr Val Ala Phe Ala Ser Pro Thr
225                 230                 235                 240

Gln Tyr Glu Ala Gly Gly Lys Val Ile Asn Ile Gly Tyr Glu Asn Asp
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Pro Val Phe Arg Ala Leu Asp Gly Thr Ser Leu Thr Leu Pro Ser Leu
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Ile Leu Asn Ile Pro Thr Trp Leu Ser His Leu Pro Phe Phe Tyr Gln
305                 310                 315                 320

Asp Gly Leu Met Arg Val Leu Asn Ser Glu Phe Tyr Ser Leu Thr Asp
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Lys Asp Ser Thr Ile Ile Val Ser Asn Leu Ser Asn Val Thr Arg Gly
            340                 345                 350

Asn Thr Trp Val Glu Asp Leu Asn Arg Asn Ala Glu Thr His Ser Gly
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Pro Thr Phe Ile Ile Gly Ser Asp Gly Asn Asp Leu Ile Lys Gly Gly
    370                 375                 380

Lys Gly Asn Asp Tyr Leu Glu Gly Arg Asp Gly Asp Asp Ile Phe Arg
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Asp Ala Gly Gly Tyr Asn Leu Ile Ala Gly Gly Lys Gly His Asn Ile
                405                 410                 415

Phe Asp Thr Gln Gln Ala Leu Lys Asn Thr Glu Val Ala Tyr Asp Gly
            420                 425                 430

Asn Thr Leu Tyr Leu Arg Asp Ala Lys Gly Gly Ile Thr Leu Ala Asp
        435                 440                 445

Asp Ile Ser Thr Leu Arg Ser Lys Glu Thr Ser Trp Leu Ile Phe Ser
    450                 455                 460

Lys Glu Val Asp His Gln Val Thr Ala Ala Gly Leu Lys Ser Asp Ser
465                 470                 475                 480

Gly Leu Lys Ala Tyr Ala Ala Ala Thr Thr Gly Gly Asp Gly Asp Asp
                485                 490                 495

Val Leu Gln Ala Arg Ser His Asp Ala Trp Leu Phe Gly Asn Ala Gly
            500                 505                 510

Asn Asp Thr Leu Ile Gly His Ala Gly Gly Asn Leu Thr Phe Val Gly
        515                 520                 525

Gly Ser Gly Asp Asp Ile Leu Lys Gly Ala Gly Asn Gly Asn Thr Phe
    530                 535                 540
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Leu Phe Ser Gly Asp Phe Gly Arg Asp Gln Leu Tyr Gly Phe Asn Ala
545 550 555 560

Thr Asp Lys Leu Val Phe Ile Gly Thr Glu Gly Ala Ser Gly Asn Ile
565 570 575

Arg Asp Tyr Ala Thr Gln Gln Asn Asp Asp Leu Val Leu Ala Phe Gly
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SEQUENCE LISTING

<110> National University Of Singapore

<120> METHOD OF CONVERTING GREASE CONTAINING HIGH CONTENT OF FREE FATTY ACIDS TO FATTY ACID ESTERS AND CATALYSTS FOR USE IN SAID METHOD

<130> 1202327

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<170> PatentIn version 3.5

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Ala Phe Ser Gln Pro Lys Ser Val Leu Asp Ala Gly Leu Thr Cys Gln
        35                  40                  45

Gly Ala Ser Pro Ser Ser Val Ser Lys Pro Ile Leu Leu Val Pro Gly
    50                  55                  60

Thr Gly Thr Thr Gly Pro Gln Ser Phe Asp Ser Asn Trp Ile Pro Leu
65                  70                  75                  80

Ser Thr Gln Leu Gly Tyr Thr Pro Cys Trp Ile Ser Pro Pro Pro Phe
                85                  90                  95

Met Leu Asn Asp Thr Gln Val Asn Thr Glu Tyr Met Val Asn Ala Ile
            100                 105                 110

Thr Ala Leu Tyr Ala Gly Ser Gly Asn Asn Lys Leu Pro Val Leu Thr
        115                 120                 125

Trp Ser Gln Gly Gly Leu Val Ala Gln Trp Gly Leu Thr Phe Phe Pro
    130                 135                 140

Ser Ile Arg Ser Lys Val Asp Arg Leu Met Ala Phe Ala Pro Asp Tyr
145                 150                 155                 160

Lys Gly Thr Val Leu Ala Gly Pro Leu Asp Ala Leu Ala Val Ser Ala
                165                 170                 175

Pro Ser Val Trp Gln Gln Thr Thr Gly Ser Ala Leu Thr Thr Ala Leu
            180                 185                 190

Arg Asn Ala Gly Gly Leu Thr Gln Ile Val Pro Thr Thr Asn Leu Tyr
        195                 200                 205

Ser Ala Thr Asp Glu Ile Val Gln Pro Gln Val Ser Asn Ser Pro Leu
    210                 215                 220

Asp Ser Ser Tyr Leu Phe Asn Gly Lys Asn Val Gln Ala Gln Ala Val
225                 230                 235                 240

Cys Gly Pro Leu Phe Val Ile Asp His Ala Gly Ser Leu Thr Ser Gln
                245                 250                 255
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Phe Ser Tyr Val Val Gly Arg Ser Ala Leu Arg Ser Thr Thr Gly Gln
            260                 265                 270

Ala Arg Ser Ala Asp Tyr Gly Ile Thr Asp Cys Asn Pro Leu Pro Ala
        275                 280                 285

Asn Asp Leu Thr Pro Glu Gln Lys Val Ala Ala Ala Ala Leu Leu Ala
    290                 295                 300

Pro Ala Ala Ala Ala Ile Val Ala Gly Pro Lys Gln Asn Cys Glu Pro
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Asp Leu Met Pro Tyr Ala Arg Pro Phe Ala Val Gly Lys Arg Thr Cys
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Ser Gly Ile Val Thr Pro
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Glu Val Glu Lys Ala Asp Ala Thr Phe Leu Tyr Ser Phe Glu Asp Ser
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Gly Val Gly Asp Val Thr Gly Phe Leu Ala Leu Asp Asn Thr Asn Lys
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Gly Asn Leu Asn Phe Asp Leu Lys Glu Ile Asn Asp Ile Cys Ser Gly
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Cys Arg Gly His Asp Gly Phe Thr Ser Ser Trp Arg Ser Val Ala Asp
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Thr Leu Arg Gln Lys Val Glu Asp Ala Val Arg Glu His Pro Asp Tyr
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Arg Val Val Phe Thr Gly His Ser Leu Gly Gly Ala Leu Ala Thr Val
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Ala Gly Ala Asp Leu Arg Gly Asn Gly Tyr Asp Ile Asp Val Phe Ser

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Ser Glu Gly Asn Leu Thr Ala Ile Gly Ile Ser Phe Arg Gly Thr Ser
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Gly Pro Arg Glu Ser Leu Ile Gly Asp Thr Ile Gly Asp Val Ile Asn
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Asp Leu Leu Ala Gly Phe Gly Pro Lys Gly Tyr Ala Asp Gly Tyr Thr
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Asp Gly Leu Met Arg Val Leu Asn Ser Glu Phe Tyr Ser Leu Thr Asp
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Lys Asp Ser Thr Ile Ile Val Ser Asn Leu Ser Asn Val Thr Arg Gly
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Asn Thr Trp Val Glu Asp Leu Asn Arg Asn Ala Glu Thr His Ser Gly
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Pro Thr Phe Ile Ile Gly Ser Asp Gly Asn Asp Leu Ile Lys Gly Gly
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Lys Gly Asn Asp Tyr Leu Glu Gly Arg Asp Gly Asp Asp Ile Phe Arg
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Asp Ala Gly Gly Tyr Asn Leu Ile Ala Gly Gly Lys Gly His Asn Ile
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Phe Asp Thr Gln Gln Ala Leu Lys Asn Thr Glu Val Ala Tyr Asp Gly
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Asn Thr Leu Tyr Leu Arg Asp Ala Lys Gly Gly Ile Thr Leu Ala Asp
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Asp Ile Ser Thr Leu Arg Ser Lys Glu Thr Ser Trp Leu Ile Phe Ser
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Val Leu Gln Ala Arg Ser His Asp Ala Trp Leu Phe Gly Asn Ala Gly
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Gly Ser Gly Asp Asp Ile Leu Lys Gly Ala Gly Asn Gly Asn Thr Phe
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Arg Asp Tyr Ala Thr Gln Gln Asn Asp Asp Leu Val Leu Ala Phe Gly
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