**Table 1. Classification of vegetable oils**

|  |  |
| --- | --- |
| Type based on FA composition | Vegetable oils |
| Lauric acid oils | Coconut oil, palm kernel oil |
| Palmitic acid oils | Palm oil |
| High oleic acid oils | Olive oil, rapeseed oil, camellia oil, avocado oil |
| Oleic/linoleic acid oils | Sunflower oil, soybean oil, sesame oil, corn oil, wheat germ oil, rice bran oil, evening primrose oil |
| Linolenic acid oils | Flax seed oil |
| Special fatty acid oils | Pine seed oil, melon seed oil, pomegranate seed oil |

**Table 2. Fatty acid composition of vegetable oils (%, wt)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| FA | Coconutoil | Palm kernel oil | Palm oil | Olive oil | Rapeseed oil | Camellia oil | Avocado oil | Sunflower oil | Soybean oil |
| 8:0 | 5.71 | 2.99 | - | - | - | - | - | - | - |
| 10:0 | 5.56 | 3.17 | - | - | - | - | - | - | - |
| 12:0 | 47.70 | 47.14 | 0.42 | - | - | - | - | - | - |
| 14:0 | 19.30 | 16.39 | 1.09 | - | - | - | 0.06 | - | 0.09 |
| 16:0 | 9.97 | 8.83 | 43.69 | 10.79 | 4.16 | 8.12 | 13.05 | 12.30 | 10.74 |
| 17:0 | - | - | 0.11 | 0.07 | 0.12 | 0.08 | - | 0.09 | 0.12 |
| 18:0 | 3.00 | 2.29 | 4.62 | 3.30 | 1.74 | 2.23 | 0.47 | 2.00 | 4.49 |
| 20:0 | - | - | - | 0.46 | 0.50 | 0.32 | - | 0.49 | 0.33 |
| 22:0 | - | - | 0.08 | 0.12 | 0.34 | 0.12 | - | 0.16 | 0.42 |
| 24:0 | - | - | 0.09 | 0.06 | 0.18 | 0.06 | - | 0.20 | 0.16 |
| 16:1 9*c* | - | - | 0.17 | 0.80 | 0.25 | 0.12 | 4.57 | 0.10 | 0.10 |
| 17:1 10*c* | - | - | - | 0.10 | - | 0.08 | 0.12 | 0.05 | 0.06 |
| 18:1 9*c* | 7.03 | 16.25 | 39.02 | 78.37 | 61.84 | 77.81 | 71.37 | 31.28 | 22.98 |
| 20:1 11*c* | - | 0.13 | 0.42 | 0.41 | 0.62 | 0.08 | - | 0.44 | 0.40 |
| 18:2 9*c*,12*c* | 1.74 | 2.71 | 9.96 | 4.51 | 20.11 | 10.06 | 9.42 | 51.81 | 52.68 |
| 18:3 6*c*,9*c*,12*c* | - | 0.08 | 0.13 | 0.24 | 1.24 | 0.56 | 0.26 | 0.24 | 0.17 |
| 18:3 9*c*,12*c*,15*c* | - | - | 0.20 | 0.64 | 7.68 | 0.17 | 0.58 | 0.66 | 6.70 |
| SFA | 91.24 | 80.81 | 50.1 | 14.8 | 7.04 | 10.93 | 13.58 | 15.24 | 16.35 |
| MUFA | 7.03 | 16.38 | 39.61 | 79.68 | 62.71 | 78.09 | 76.06 | 31.87 | 23.54 |
| PUFA | 1.74 | 2.79 | 10.29 | 5.39 | 29.03 | 10.79 | 10.26 | 52.71 | 59.55 |
|  |  |  |  |  |  |  |  |  |  |
| FA | Sesame oil | Corn oil | Rice bran oil | Wheat germ oil | Evening primrose oil | Flax seed oil | Pine seed oil | Melon seed oil | Pomegranate seed oil |
| 14:0 | - | - | 0.22 | - | - | - | - | - | - |
| 16:0 | 10.78 | 12.30 | 16.46 | 14.65 | 6.55 | 5.32 | 4.32 | 3.82 | 2.70 |
| 17:0 | 0.10 | 0.09 | 0.07 | - | 0.11 | 0.08 | - | 0.24 | - |
| 18:0 | 3.41 | 2.00 | 1.56 | 0.68 | 2.80 | 3.66 | 2.01 | 3.29 | 2.29 |
| 20:0 | 1.03 | 0.49 | 0.85 | - | - | 0.26 | - | 0.13 | 0.43 |
| 22:0 | 1.58 | 0.16 | 0.22 | 0.09 | - | 0.13 | 0.12 | - | 0.11 |
| 24:0 | 1.33 | 0.20 | 0.28 | 0.09 | - | 0.08 | - | - | - |
| 16:1 9*c* | 0.09 | 0.10 | 0.16 | 0.22 | - | 0.06 | - | - | - |
| 17:1 10*c* | 0.06 | 0.05 | - | - | - | 0.05 | - | - | - |
| 18:1 9*c* | 45.67 | 31.28 | 39.01 | 15.97 | 7.55 | 19.45 | 22.64 | 20.57 | 5.37 |
| 20:1 11*c* | 1.44 | 0.44 | 0.58 | 0.14 | - | 0.18 | 1.10 | 0.36 | 0.35 |
| 18:2 9*c*,12*c* | 33.24 | 51.81 | 39.20 | 60.38 | 72.82 | 16.23 | 49.65 | 38.37 | 6.37 |
| 18:3 5*c*,9*c*,12*c* 1 | - | - | - | - | - | - | 15.82 | - | - |
| 18:3 6*c*,9*c*,12*c* | 1.07 | 0.24 | 0.59 | 1.35 | 9.41 | 0.18 | - | - | - |
| 20:2 11*c*,14*c* | - | - | - | - | - | - | 0.62 | - | - |
| 18:3 9*c*,12*c*,15*c* | 0.14 | 0.66 | 0.78 | 5.77 | 1.19 | 54.30 | 1.68 | 0.04 | 0.50 |
| CLnA 2 | - | - | - | - | - | - | - | 32.34 | 81.82 |
| 20:3 11*c*,14*c*,17*c* | - | - | - | - | - | - | 1.43 | - | - |
| SFA | 18.23 | 15.24 | 19.66 | 15.51 | 9.46 | 9.53 | 6.45 | 7.48 | 5.53 |
| MUFA | 47.26 | 31.87 | 39.75 | 16.33 | 7.55 | 19.74 | 23.74 | 20.93 | 5.72 |
| PUFA | 34.45 | 52.71 | 40.57 | 67.50 | 83.42 | 70.71 | 69.20 | 70.75 | 88.69 |

1 Pinolenic acid; 2 Conjugated linoleic acid mainly containing 18:3 9*c*,11*t*,13*c*.

**Table 3. Fatty acid (FA) composition at *sn*-2 position on the glycerol backbone of vegetable oils (%, wt)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| FA | Coconutoil | Palm kernel oil | Palm oil | Olive oil | Rapeseed oil | Camellia oil | Avocado oil | Sunflower oil | Soybean oil |
| 8:0 | 1.44 | 1.75 | - | - | - | - | - | - | - |
| 10:0 | 3.46 | 2.85 | - | - | - | - | - | - | - |
| 12:0 | 76.91 | 63.49 | 1.85 | - | - | - | - | - | - |
| 14:0 | 9.35 | 14.77 | 1.96 | - | - | - | - | - | - |
| 16:0 | 3.06 | 4.63 | 14.89 | 4.83 | 1.81 | 1.20 | 0.82 | 4.58 | 3.56 |
| 18:0 | 0.88 | 0.82 | 4.23 | 1.07 | 0.88 | 0.64 | 1.72 | 2.40 | 1.92 |
| 16:1 9*c* | - | - | - | - | - | 0.24 | 4.39 | - | - |
| 18:1 9*c* | 3.62 | 8.40 | 57.63 | 80.93 | 52.80 | 70.13 | 66.59 | 22.81 | 22.45 |
| 20:1 11*c* | - | 1.40 | 0.21 | 1.51 | 1.10 | - | - | 0.35 | - |
| 18:2 9*c*,12*c* | 1.28 | 1.90 | 19.4 | 11.66 | 31.38 | 26.66 | 23.15 | 69.60 | 65.38 |
| 18:3 6*c*,9*c*,12*c* | - | - | - | - | 12.03 | 1.13 | 3.33 | 0.26 | - |
| 18:3 9*c*,12*c*,15*c* | - | - | - | - | - | - | - | - | 6.68 |
| SFA | 64.12 | 58.31 | 22.93 | 5.90 | 2.69 | 1.84 | 9.49 | 6.98 | 5.48 |
| MUFA | 29.85 | 39.79 | 57.84 | 82.44 | 53.90 | 70.37 | 64.03 | 22.96 | 22.45 |
| PUFA | 6.03 | 1.90 | 19.4 | 11.66 | 43.41 | 27.79 | 26.48 | 70.06 | 72.06 |
|  |  |  |  |  |  |  |  |  |  |
| FA | Sesame oil | Corn oil | Rice bran oil | Wheat germ oil | Evening primrose oil | Flax seed oil | Pine seed oil | Melon seed oil | Pomegranate seed oil |
| 16:0 | 8.55 | 4.20 | 5.63 | 3.38 | 1.77 | 4.99 | 3.57 | 1.87 | 2.77 |
| 18:0 | 3.90 | 0.99 | 1.07 | 0.74 | 1.22 | 2.29 | 2.46 | 5.85 | 2.40 |
| 18:1 9*c* | 39.92 | 29.63 | 39.65 | 9.89 | 9.26 | 30.51 | 24.02 | 18.59 | 5.30 |
| 20:1 11*c* | - | 1.17 | 0.39 | 0.26 | - | 2.08 | - | - | 7.77 |
| 18:2 9*c*,12*c* | 47.14 | 61.81 | 51.72 | 76.64 | 86.29 | 26.44 | 67.40 | 59.75 | 15.26 |
| 18:3 5*c*,9*c*,12*c* | - | - | - | - | - | - | 2.55 | - | - |
| 18:3 6*c*,9*c*,12*c* | 0.49 | 1.11 | 1.02 | 9.09 | 1.46 | 1.67 | - | - | - |
| 18:3 9*c*,12*c*,15*c* | - | 1.09 | 0.52 | - | - | 32.02 | - | - | - |
| CLnA | - | - | - | - | - | - | - | 13.94 | 66.50 |
| SFA | 12.45 | 5.19 | 6.70 | 4.12 | 2.99 | 7.28 | 6.03 | 7.72 | 5.17 |
| MUFA | 39.92 | 30.8 | 40.04 | 10.15 | 9.26 | 32.59 | 24.02 | 18.59 | 13.07 |
| PUFA | 47.63 | 64.01 | 53.26 | 85.73 | 87.75 | 60.13 | 69.95 | 73.69 | 81.76 |

**Table 4. Relative abundances of the identified TAGs in lauric acid oils, palmitic acid oils, high oleic acid and oleic/linoleic acid oils (%, wt)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TAG | ECN 1 | Coconut oil | Palm kernel oil | Palm oil | Olive oil | Rapeseed oil | Camellia oil | Avocado oil | Sunflower oil | Soybean oil |
| CaCaCa | 30 | 1.64 | 0.70 | - | - | - | - | - | - | - |
| CaCaLa | 32 | 8.12 | 4.31 | - | - | - | - | - | - | - |
| CaLaLa | 34 | 11.97 | 6.34 | - | - | - | - | - | - | - |
| LaLaLa | 36 | 14.40 | 16.55 | - | - | - | - | - | - | - |
| LnLnL | 38 | - | - | - | - | 0.77 | - | - | - | 1.33 |
| LaLaM | 38 | 14.02 | 13.22 | - | - | - | - | - | - | - |
| LnLL | 40 | - | - | - | - | 3.73+OLnLn | - | - | - | 7.68 |
| PLnLn | 40 | - | - | - | - | 0.44 | - | - | - | - |
| LaLaO | 40 | 3.07 | 5.31 | - | - | - | - | - | - | - |
| LaMM | 40 | 9.48 | 8.13 | - | - | - | - | - | - | - |
| LLL | 42 | - | - | - | 0.47 | 8.94 | 2.44+OLLn | 0.90 | 19.70 | 20.73+OLLn |
| PLLn | 42 | - | - | - | - | 1.21 | - | - | - | 3.53 |
| PoLL | 42 | - | - | - | - | - | - | 0.57 | - | - |
| LaMO | 42 | 2.81 | 4.88 | - | - | - | - | - | - | - |
| LaPM | 42 | 5.35 | 4.23 | - | - | - | - | - | - | - |
| LaOO | 44 | 1.60 | 4.16 | - | - | - | - | - | - | - |
| LaPO/MMO | 44 | 2.60 | 4.98 | - | - | - | - | - | - | - |
| LaPP | 44 | 2.68 | 2.24 | - | - | - | - | - | - | - |
| OLL | 44 | - | - | 1.45 | 2.81 | 18.63 | 5.69+OOLn | 3.49+ OOLn | 26.74+OOLn | 17.24 |
| PLL | 44 | - | - | 3.18 | 1.32 | 3.52 | 2.13 | 3.89+PoOL | 8.59 | 12.16 |
| OOL | 46 | - | - | 3.27 | 9.43 | 21.21 | 13.42 | 13.13 | 18.26+SLL | 12.42 |
| POL | 46 | - | - | 11.40 | 5.89 | 4.65 | 5.59 | 14.42+PoOO | 6.92 | 8.20 |
| PPL | 46 | - | - | 9.31 |  | 0.97 | - | 4.08+PoPO | 1.44 | 2.08 |
| MPO | 46 | 2.73 | 3.63 | - |  | - | - | - | - | - |
| OOO | 48 | 4.74+SOL | 5.04+SOL | 6.04 | 45.13 | 25.30 | 47.69 | 33.92 | 10.84+SOL | 7.05+SOL |
| POO | 48 | 6.08 | 6.32 | 24.78 | 21.42 | 5.59 | 14.36 | 20.53 | 3.80 | 5.48 |
| PPO | 48 | 3.56 | 3.96 | 26.03 | 2.92 | 0.96 | 1.79 | 3.09 | 0.88 | - |
| PPP | 48 | 1.02 | 1.32 | - |  | - | - | - | 0.86 | - |
| SOO | 50 | 2.10 | 2.04 | 3.96 | 8.03 | 2.99 | 5.48 | 1.07 | 1.78 | 2.09 |
| POS | 50 | 1.99 | 2.10 | 6.58 | 1.95 | 0.78 | 1.00 | 0.61 | - | - |
| SPP | 50 | - | - | 2.14 | - | - | - | 0.31 | - | - |
| SSO | 52 | - | 0.53 | 1.04 | 0.62 | 0.30 | 0.49 | - | 0.18 | - |
| SSP | 52 | - | - | 0.59 | - | - | - | - | - | - |
| SSS | 54 | - | - | 0.22 | - | - | - | - | - | - |

1 ECN, equivalent carbon number ECN = CN–2\*BD.

**Table 5. Relative Abundances of the identified TAGs in the oleic/linoleic acid oils, linolenic acid oils, and some special fatty acid oils (%, wt)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TAG | ECN 1 | Sesame oil | Corn oil | Wheat germ oil | Rice bran oil | Evening primrose oil | Flax seed oil | Pine seed oil 2 | Melon seed oil 3 | Pomegranate seed oil 3 |
| LnLnLn | 36 | - | - | - | - | 0.49 | 18.07 | 0.32  | - | 32.45  |
| LnLnL | 38 | - | - | 1.23 | - | 3.16 | 12.34 | 1.86  | 16.06 | 12.87 |
| LnLL | 40 | 0.38 | 1.21 | 7.51 | 1.13 | 16.37 | 16.74+OLnLn | 23.38  | 17.77+OLnLn | 15.84+OLnLn |
| PLnLn | 40 | - | - | - | - | - | 5.37 | - | - | 7.50 |
| LLL | 42 | 12.92+OLLn | 16.93 | 22.85 | 8.63 | 33.80 | 12.53+SLnLn | 10.71 | 21.27 | 10.51+SLnLn |
| OLLn | 42 | - | - | - | - | - | - | 14.18  | - | - |
| PLLn | 42 | - | - | 4.87 | - | 4.10 | 3.05 | 4.23  | 6.14 | - |
| OLL | 44 | 19.74+OOLn | 21.79 | 14.56 | 15.24 | 11.38 | 11.44+SLLn | 11.12 | 13.82 | 3.91+SLLn |
| OOLn | 44 | - | - | - | - | - | - | 7.97  | - | - |
| PLL | 44 | 6.91+POLn | 12.43 | 22.05 | 11.24 | 11.77 | - | 3.16 | 3.30 | 2.01 |
| POLn | 44 | - | - | - | - | - | 4.68 | 1.88  |  | - |
| OOL | 46 | 20.22+SLL | 15.76 | 6.40 | 16.09 | 6.60 | 6.17 | 8.17 | 5.40 | 2.67 |
| POL | 46 | 9.29 | 12.50 | 10.68 | 16.58 | 3.62 | 2.24 | 3.32 | 2.70 | 2.39 |
| PPL | 46 | 1.74 | 3.03 | 2.70 | 4.96 | 1.88 | - | - | 1.41 | - |
| OOO | 48 | 14.25+SOL | 7.67 | 3.07 | 11.69 | 2.82 | 4.21 | 8.08 | 3.43 | 2.58 |
| SOL | 48 | - | - | - | - | - | - | - | -- | - |
| POO | 48 | 6.99 | 5.31 | 3.54 | 9.55 | 3.11 | 2.01 | 1.62 | 4.00 | 3.41 |
| PPO | 48 | 1.15 | 1.42 | - | 2.49 | - | - | - | 2.23 | 1.82 |
| SOO | 50 | 4.48 | 1.36 | 0.53 | 1.71 | 0.89 | 1.14 | - | 1.24 | 0.98 |
| POS | 50 | 1.29 | 0.59 | - | 0.68 | - | - | - | 1.23 | 1.06 |
| SSO | 52 | 0.64s | - | - | -- | - | - | - | -- | - |

1 ECN, equivalent carbon number (ECN = CN−2\*BD). 2 In the TAGs of pine seed oil, the fatty acid Ln means pinolenic acid; 3 In the TAGs of melon seed oil and pomegranate seed oil, Ln mainly means CLnA. Fatty acid in TAG: Ca, 10:0; La, 12:0; M, 14:0; P, 16:0; Po, 16:1 9*c*; S, 18:0; O, 18:1 9*c*; L 18:2 9*c*,12*c*; Ln, 18:3 9*c*,12*c*,15*c.*