Examples of Unsaturated Fatty Acids

Common name	Chemical structure	C:D	n–x
Myristoleic acid	$CH_3(CH_2)_3$**CH=CH**$(CH_2)_7COOH$	14:1	n–5
Palmitoleic acid	$CH_3(CH_2)_5$**CH=CH**$(CH_2)_7COOH$	16:1	n–7
Sapienic acid	$CH_3(CH_2)_8$**CH=CH**$(CH_2)_4COOH$	16:1	n–10
Oleic acid	$CH_3(CH_2)_7$**CH=CH**$(CH_2)_7COOH$	18:1	n–9
Elaidic acid	$CH_3(CH_2)_7$**CH=CH**$(CH_2)_7COOH$	18:1	n–9
Vaccenic acid	$CH_3(CH_2)_5$**CH=CH**$(CH_2)_9COOH$	18:1	n–7
Linoleic acid	$CH_3(CH_2)_4$**CH=CH**CH_2**CH=CH**$(CH_2)_7COOH$	18:2	n–6
Linoelaidic acid	$CH_3(CH_2)_4$**CH=CH**CH_2**CH=CH**$(CH_2)_7COOH$	18:2	n–6
α-Linolenic acid	CH_3CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**$(CH_2)_7COOH$	18:3	n–3
Arachidonic acid	$CH_3(CH_2)_4$**CH=CH**CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**$(CH_2)_3COOH$[NIST]	20:4	n–6
Eicosapentaenoic acid	CH_3CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**$(CH_2)_3COOH$	20:5	n–3
Erucic acid	$CH_3(CH_2)_7$**CH=CH**$(CH_2)_{11}COOH$	22:1	n–9
Docosahexaenoic acid	CH_3CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**CH_2**CH=CH**$(CH_2)_2COOH$	22:6	n–3

Essential fatty acids

Fatty acids that are required by the human body but cannot be made in sufficient quantity from other substrates and therefore must be obtained from food and are called essential fatty acids. There are two series of essential fatty acids: one has a double bond three carbon atoms removed from the methyl end; the other has a double bond six carbon atoms removed from the methyl end. Humans lack the ability to introduce double bonds in fatty acids beyond carbons 9 and 10, as counted from the carboxylic acid side., Two essential fatty acids are linoleic acid (LA) and alpha-linolenic acid (ALA). They are widely distributed in plant oils. The human body has a limited ability to convert ALA into the longer-chain n-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which can also be obtained from fish.

Saturated fatty acids

Saturated fatty acids are long-chain carboxylic acids that usually have between 12 and 24 carbon atoms and have no double bonds. Thus, saturated fatty acids are saturated with hydrogen (since

double bonds reduce the number of hydrogens on each carbon). Because saturated fatty acids have only single bonds, each carbon atom within the chain has 2 hydrogen atoms (except for the omega carbon at the end that has 3 hydrogens).

Examples of Saturated Fatty Acids

Common name	Chemical structure	C:D
Lauric acid	$CH_3(CH_2)_{10}COOH$	12:0
Myristic acid	$CH_3(CH_2)_{12}COOH$	14:0
Palmitic acid	$CH_3(CH_2)_{14}COOH$	16:0
Stearic acid	$CH_3(CH_2)_{16}COOH$	18:0
Arachidic acid	$CH_3(CH_2)_{18}COOH$	20:0
Behenic acid	$CH_3(CH_2)_{20}COOH$	22:0
Lignoceric acid	$CH_3(CH_2)_{22}COOH$	24:0
Cerotic acid	$CH_3(CH_2)_{24}COOH$	26:0