**AUGOYE OMESIRI**

**ANATOMY**

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**BCH204**

In [biochemistry](https://en.wikipedia.org/wiki/Biochemistry) and [metabolism](https://en.wikipedia.org/wiki/Metabolism), **beta-oxidation** is the [catabolic process](https://en.wikipedia.org/wiki/Catabolism) by which [fatty acid](https://en.wikipedia.org/wiki/Fatty_acid) molecules are broken down[[1]](https://en.wikipedia.org/wiki/Beta_oxidation#cite_note-1) in the cytosol in prokaryotes and in the [mitochondria](https://en.wikipedia.org/wiki/Mitochondria) in eukaryotes to generate [acetyl-CoA](https://en.wikipedia.org/wiki/Acetyl-CoA), which enters the [citric acid cycle](https://en.wikipedia.org/wiki/Citric_acid_cycle), and [NADH](https://en.wikipedia.org/wiki/NADH) and [FADH2](https://en.wikipedia.org/wiki/FADH2), which are co-enzymes used in the [electron transport chain](https://en.wikipedia.org/wiki/Electron_transport_chain). It is named as such because the [beta carbon](https://en.wikipedia.org/wiki/Alpha_and_beta_carbon) of the fatty acid undergoes oxidation to a [carbonyl](https://en.wikipedia.org/wiki/Carbonyl) group. Beta-oxidation is primarily facilitated by the [mitochondrial trifunctional protein](https://en.wikipedia.org/wiki/Mitochondrial_trifunctional_protein), an enzyme complex associated with the [inner mitochondrial membrane](https://en.wikipedia.org/wiki/Inner_mitochondrial_membrane), although [very long chain fatty acids](https://en.wikipedia.org/wiki/Very_long_chain_fatty_acid) are oxidized in [peroxisomes](https://en.wikipedia.org/wiki/Peroxisome%22%20%5Co%20%22Peroxisome).

The overall reaction for one cycle of beta oxidation is:

C*n*-acyl-CoA + FAD + NAD+
 + H
2O + CoA → C*n*-2-acyl-CoA + FADH
2 + NADH + H+
 + acetyl-CoA

**THREE (3) STAGES OF BETA OXIDATION**

1. Hydration catalyzed by enoyl- coa hydrates, which adds water across the double bond. Its product is an l-3-hydroxyacl.
2. Acyl – coa dehydrogenase creates a double bond between the alpha and beta carbons on the fatty acid. The hydrogens are added to fao creating a molecule of fadh2.
3. Beta – hydroxyacl – coa dehydrogenase makes the carbon-OH bond between the carbon and oxygen. The lost hydrogen is added to nadh.



