**JIM UNUNUMA SUCCESS**

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**NURSING DEPARTMENT**

Beta oxidation takes place in three stages: dehydrogenation, hydration, oxidation and thyolisis. Each step is by a distinct enzymes. Briefly, each cycle of this process begins with an acyl-CoA chain and ends with one acetyl-CoA, one FADH2, one NADH and water, and the acyl-CoA chain becomes two carbon shorter. The total energy yield per cycle is 17 ATP molecules (see below for details on the breakdown). This cycle is repeated until two acetyl-CoA molecule are formed as opposed to one acyl-CoA and acetyl-CoA.

## DEHYDRATION

In the first step, acyl-CoA is oxidized by the enzyme acyl CoA dehydrogenase. A double bond is formed between the second and third carbons (C2 and C3) of the acyl-CoA chain entering the beta oxidation cycle; the end product of this reaction is trans-$\Delta^2$-enoyl-CoA (trans-delta 2-enoyl CoA). This step uses FAD and produces FADH2, which will enter the citric acid cycle and form ATP to be used as energy.

## HYDRATION

In the second step, the double bond between C2 and C3 of trans-$\Delta^2$-enoyl-CoA is hydrated, forming the end product L-ß-hydroxyacyl CoA, which has a hydroxyl group (OH) inC2, in the place of the double bond .This reaction is catalysed by another enzyme: enoyl CoA hydratase.

## OXIDATION

In the third step, the hydroxyl group in C2 of L-ß-hydroxyacyl CoA is oxidized by NAD+in a reaction that is catalysed by3-hydroxyacyl-CoA dehydrogenase. The end products are ß-ketoacyl CoA and NADH + H.

NADH will enter the citric acid cycle and produce ATP that will be used as energy