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18/MHS05/004

PHYSIOLOGY

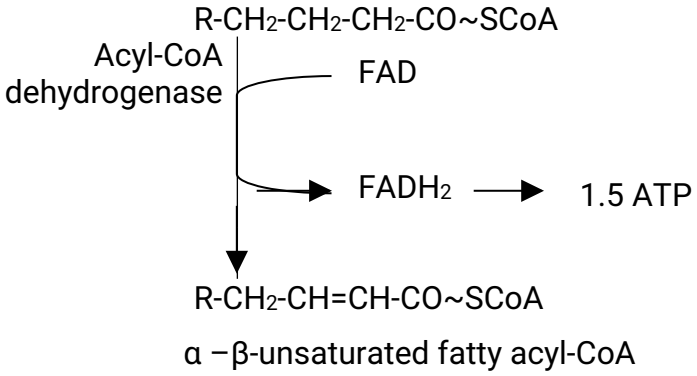
MEDICAL BIOCHEMISTRY

BCH 204

3 STAGES/STEPS OF BETA-OXIDATION

1. Dehydrogenation(FAD Linked dehydrogenase)

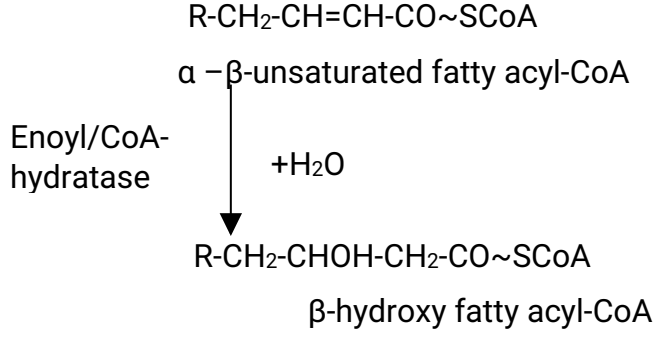
   The fatty acyl-CoA is dehydrogenated to transenoyl-CoA with FAD accepting the hydrogen atoms. $FADH_2$ when oxidised in electron transport chain will produce 1.5 ATP molecules.



α –β-unsaturated fatty acyl-CoA

2. Hydration

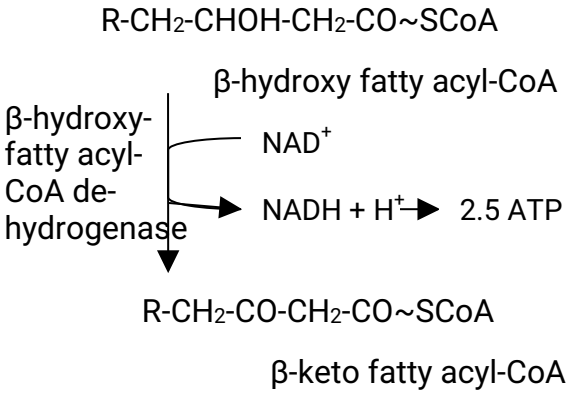
   This is catalysed by an enoyl-CoA hydratase. This step forms a beta-hydroxy fatty acyl-CoA. The L isomer alone is formed during the hydration of the trans double bond.



β-hydroxy fatty acyl-CoA

3. NAD^+ Dependent Dehydrogenase

   The beta-hydroxy fatty acyl-CoA is again oxidized to form beta-keto fatty acyl-CoA. This dehydrogenase acts only on L isomer. The NADH when oxidized in electron transport chain will generate 2.5 ATPs.



The final stage is cleavage, whereby the beta-keto fatty acyl-CoA now undergoes thiolytic cleavage, splitting off a molecule of acetyl-CoA and leaving behind a fatty acid with 2 carbon atoms less.