Energy From Fatty Acids

- Activation of the fatty acid <u>costs</u> 2 ATP. (It happens just once in the 1st step.)

- Each cycle of β-oxidation produces 1 NADH and 1 $FADH_2$.

- Each acetyl CoA produces 3 NADH, 1 $FADH_2$ and 1 ATP.

In the electron transport chain:

Each NADH → 3 ATP.
Each $FADH_2$ → 2 ATP.

For a 14-C fatty acid:

C–C ¦ C–C ¦ C–C ¦ C–C ¦ C–C ¦ C–C ¦ C–C(O)–SCoA

6 "breaks" in the chain must be made and this means 6 cycles of the β-oxidation.

From the fatty acid we produce 7 molecules of acetyl CoA.

Net Energy:

Step			ATP
Activation			-2
6 β-oxidation			
	6 NADH	(x 3 ATP)	+18
	6 $FADH_2$	(x 2 ATP)	+12
7 acetyl Co A			
From Citric Acid Cycle we get:			
	3 NADH	(x 7 times) (x 3 ATP)	+63
	1 $FADH_2$	(x 7 times) (2 ATP)	+14
	1 ATP	(x7 times)	+7
TOTAL			**112 ATP**