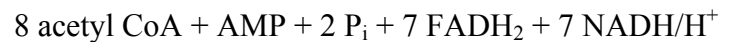
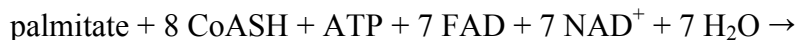


Fatty Acid β -Oxidation

Stage	Enzyme	Non-Fatty Acid		Comments
		Reactants	Products	
Fatty Acid Release	triacylglycerol lipase	H ₂ O		hormone control, phosphorylated enzyme is active form
Activation	acyl CoA synthetase (thiokinase)	ATP, CoASH	AMP, PP _i	subsequent PP _i hydrolysis pulls reaction
Transport into Mitochondria	carnitine acyltransferase I	carnitine	CoASH	links acyl to carnitine by ester linkage for transport
	carnitine acyltransferase II	CoASH	carnitine	replaces carnitine with CoA inside the mitochondria
β -oxidation	acyl CoA dehydrogenase	FAD	FADH ₂	Different forms of enzyme for different acyl lengths
	3-hydroxy acyl CoA dehydrogenase	NAD ⁺	NADH	
	3-ketoacyl thiolase	CoASH		



Fatty Acid Synthesis (Multifunctional enzyme dimer in animals = fatty acid synthase)

Stage	Enzyme	Non-Fatty Acid		Comments
		Reactants	Products	
Acetyl CoA activation	acetyl CoA carboxylase	HCO ₃ ⁻ , ATP	ADP, P _i	biotin coenzyme, allosteric control (citrate +); hormone control, unphosphorylated enzyme is active polymerized form
Elongation	3-ketoacyl-ACP synthase		CO ₂ , ACPSH	
	3-ketoacyl-ACP reductase	NADPH	NADP ⁺	
	Enoyl-ACP reductase	NADPH	NADP ⁺	
Termination	thioesterase	H ₂ O		releases palmitate from synthase

