
AdhE
acetyl-CoA + NADH
acetaldehyde + CoA + NAD+
acetaldehyde + NADH
AdhE
ethanol + NAD+

FIGURE 1

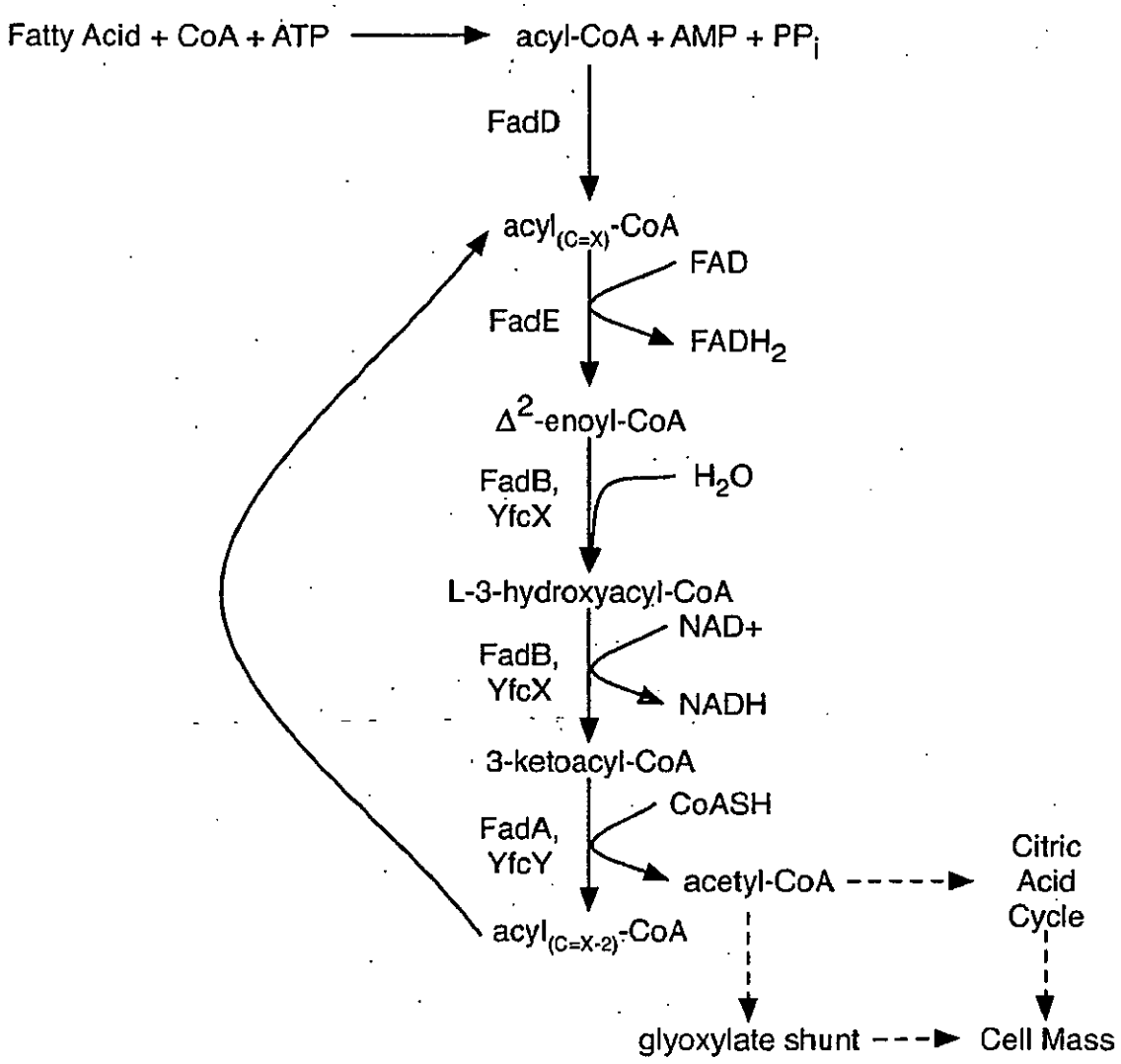

Fatty Acid + CoA + ATP
acyl-CoA + AMP + PPi
FadD
acyl(C=X)-CoA
FAD
FadE
FADH2
Δ2-enoyl-CoA
FadB, YfcX
H2O
L-3-hydroxyacyl-CoA
NAD+
FadB, YfcX
NADH
3-ketoacyl-CoA
CoASH
FadA, YfcY
acetyl-CoA
Citric Acid Cycle
acyl(C=X-2)-CoA
glyoxylate shunt
Cell Mass

FIGURE 2

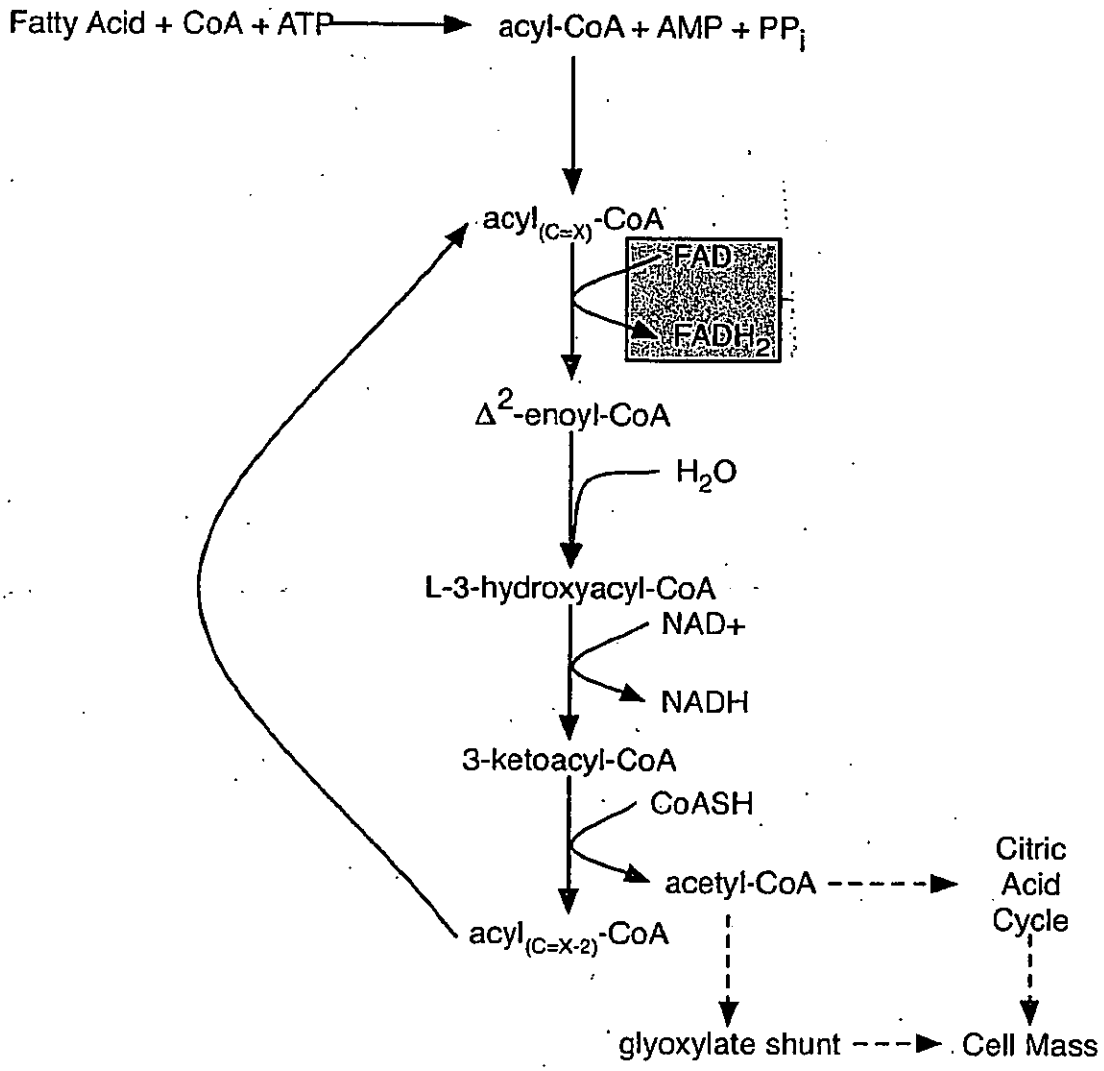
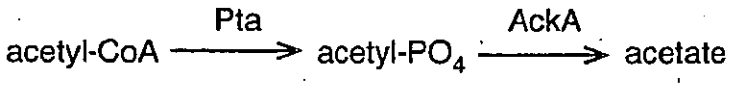

Fatty Acid + CoA + ATP
acyl-CoA + AMP + PPi
acyl(C=X)-CoA
FAD
FADH2
Δ2-enoyl-CoA
H2O
L-3-hydroxyacyl-CoA
NAD+
NADH
3-ketoacyl-CoA
CoASH
acetyl-CoA
Citric Acid Cycle
acyl(C=X-2)-CoA
glyoxylate shunt
Cell Mass

FIGURE 3

(A)


Pta
AckA
acetyl-CoA
acetyl-PO4
acetate

(B)

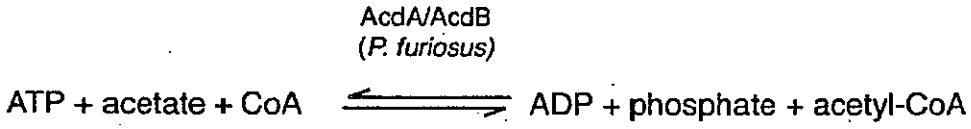

AcdA/AcdB
(P. furiosus)
ATP + acetate + CoA
ADP + phosphate + acetyl-CoA

FIGURE 4

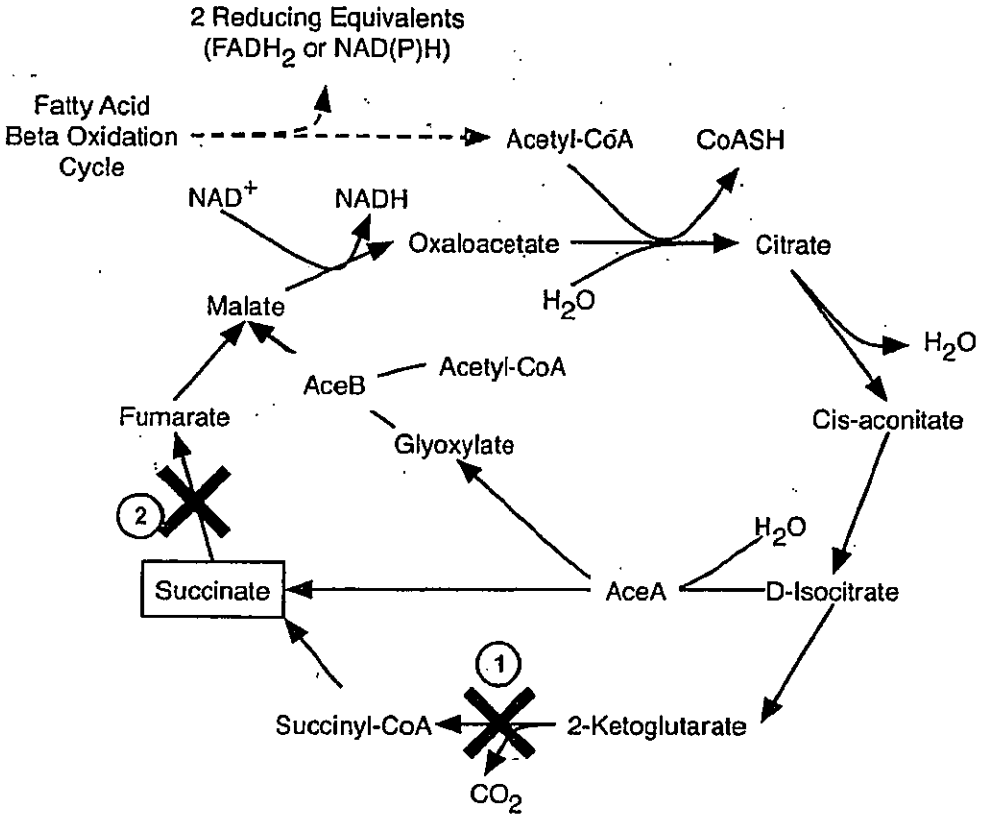

2 Reducing Equivalents
(FADH2 or NAD(P)H)
Fatty Acid
Beta Oxidation
Cycle
Acetyl-CoA
CoASH
NAD+
NADH
Oxaloacetate
Citrate
H2O
Malate
H2O
AceB
Acetyl-CoA
Fumarate
Cis-aconitate
Glyoxylate
2
H2O
Succinate
AceA
D-Isocitrate
1
Succinyl-CoA
2-Ketoglutarate
CO2

FIGURE 5

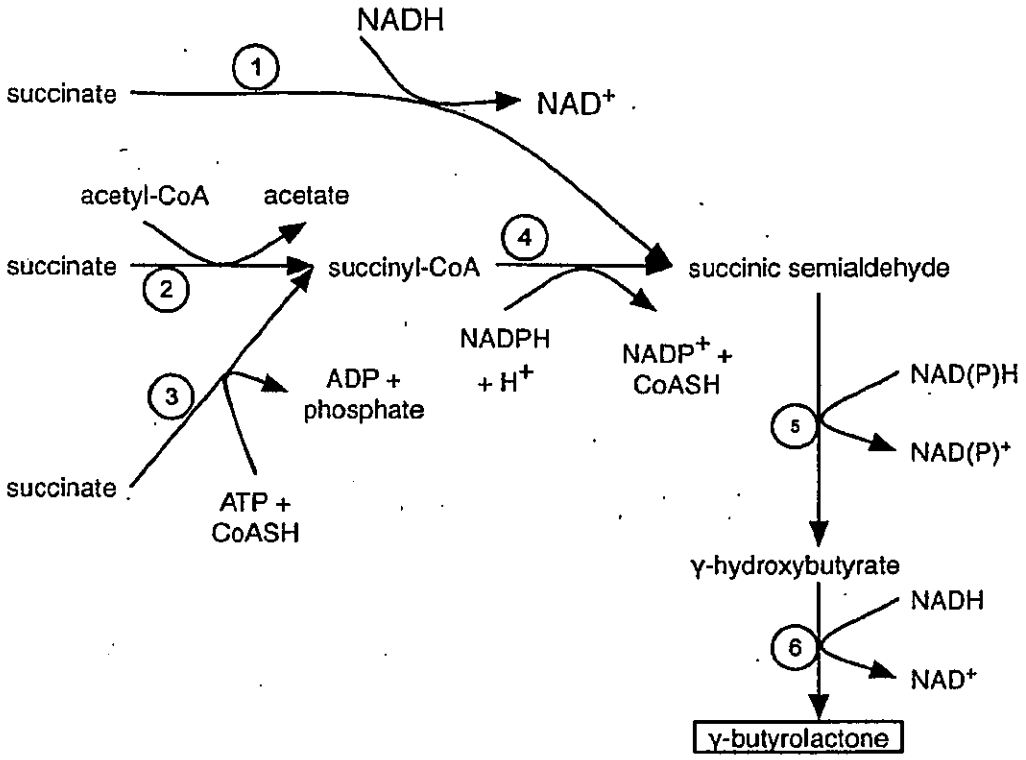

NADH
1
succinate
NAD+
acetyl-CoA
acetate
succinate
2
succinyl-CoA
4
succinic semialdehyde
NADPH
+ H+
NADP+ +
CoASH
3
ADP +
phosphate
succinate
ATP +
CoASH
5
NAD(P)H
NAD(P)+
γ-hydroxybutyrate
NADH
6
NAD+
γ-butyrolactone

FIGURE 6

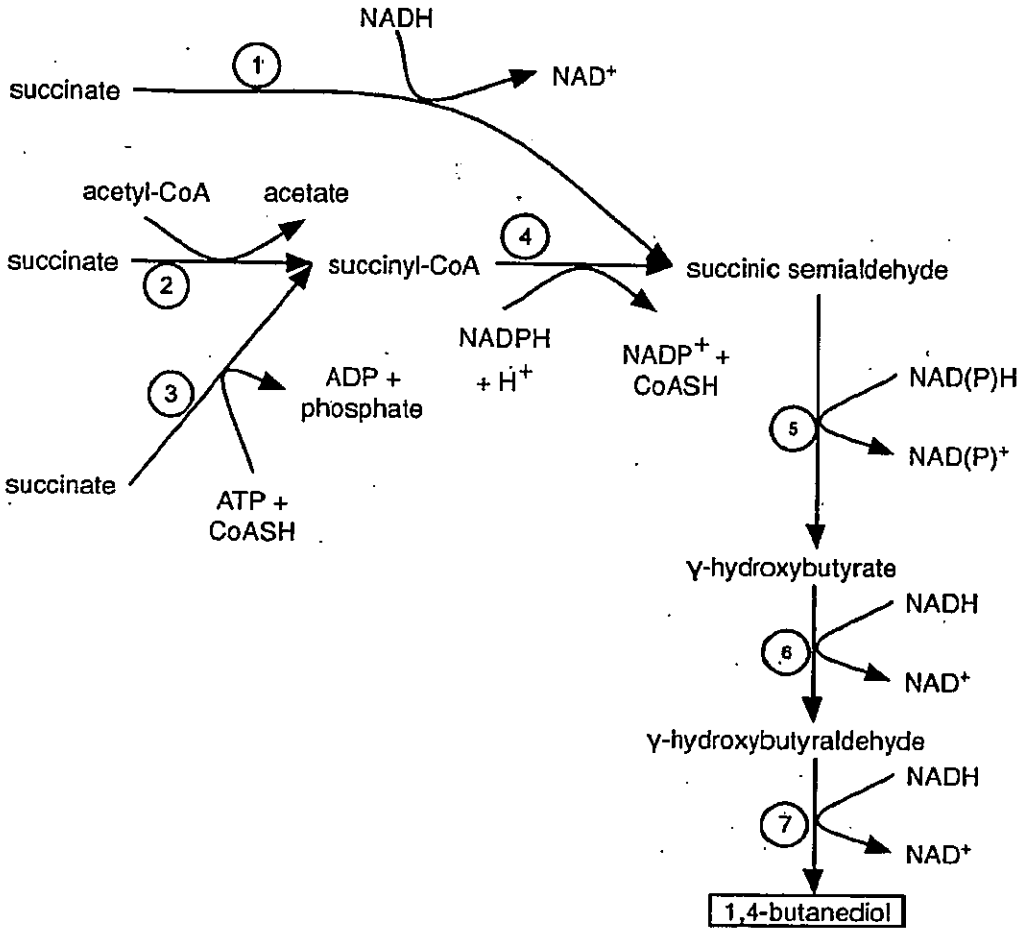

NADH
1
succinate
NAD+
acetyl-CoA
acetate
succinate
2
succinyl-CoA
4
succinic semialdehyde
NADPH
+ H+
NADP+ +
CoASH
3
ADP +
phosphate
succinate
ATP +
CoASH
5
NAD(P)H
NAD(P)+
γ-hydroxybutyrate
NADH
6
NAD+
γ-hydroxybutyraldehyde
NADH
7
NAD+
1,4-butanediol

FIGURE 7

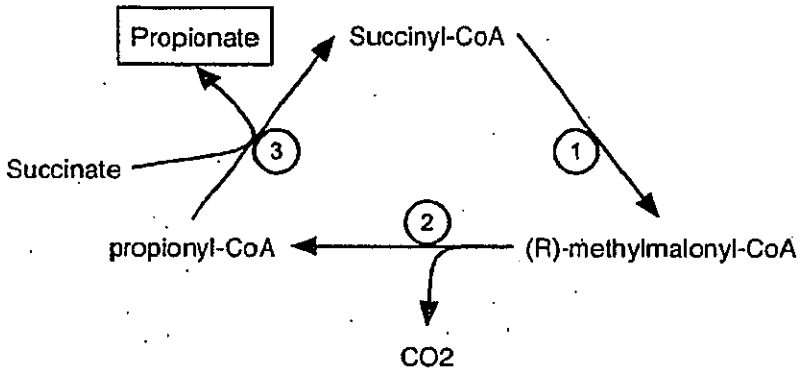

Propionate
Succinyl-CoA
Succinate
3
1
2
propionyl-CoA
(R)-methylmalonyl-CoA
CO2

FIGURE 8

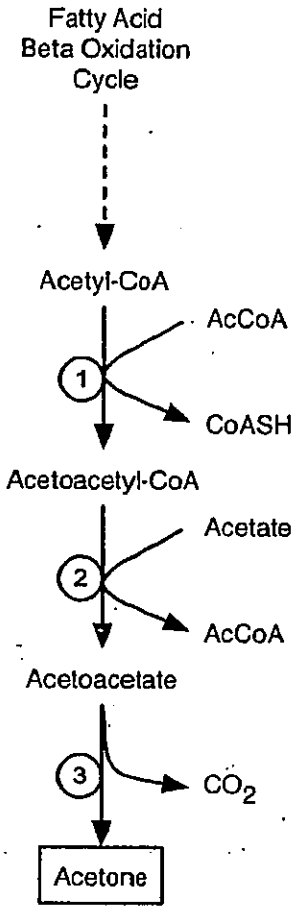

Fatty Acid
Beta Oxidation
Cycle
Acetyl-CoA
AcCoA
1
CoASH
Acetoacetyl-CoA
Acetate
2
AcCoA
Acetoacetate
3
CO_2
Acetone

FIGURE 9

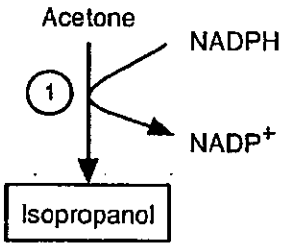


FIGURE 10

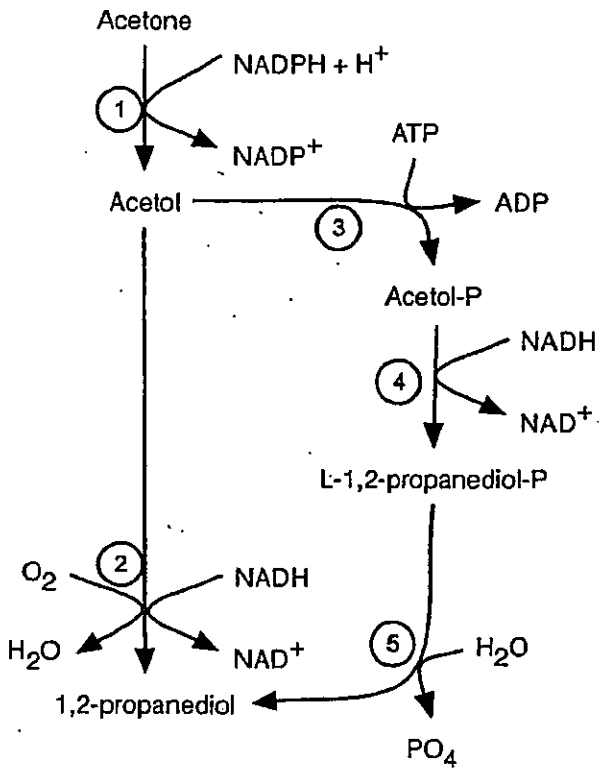

Acetone
NADPH + H+
1
NADP+
ATP
Acetol
3
ADP
Acetol-P
NADH
4
NAD+
L-1,2-propanediol-P
O2
2
NADH
H2O
NAD+
5
H2O
1,2-propanediol
PO4

FIGURE 11

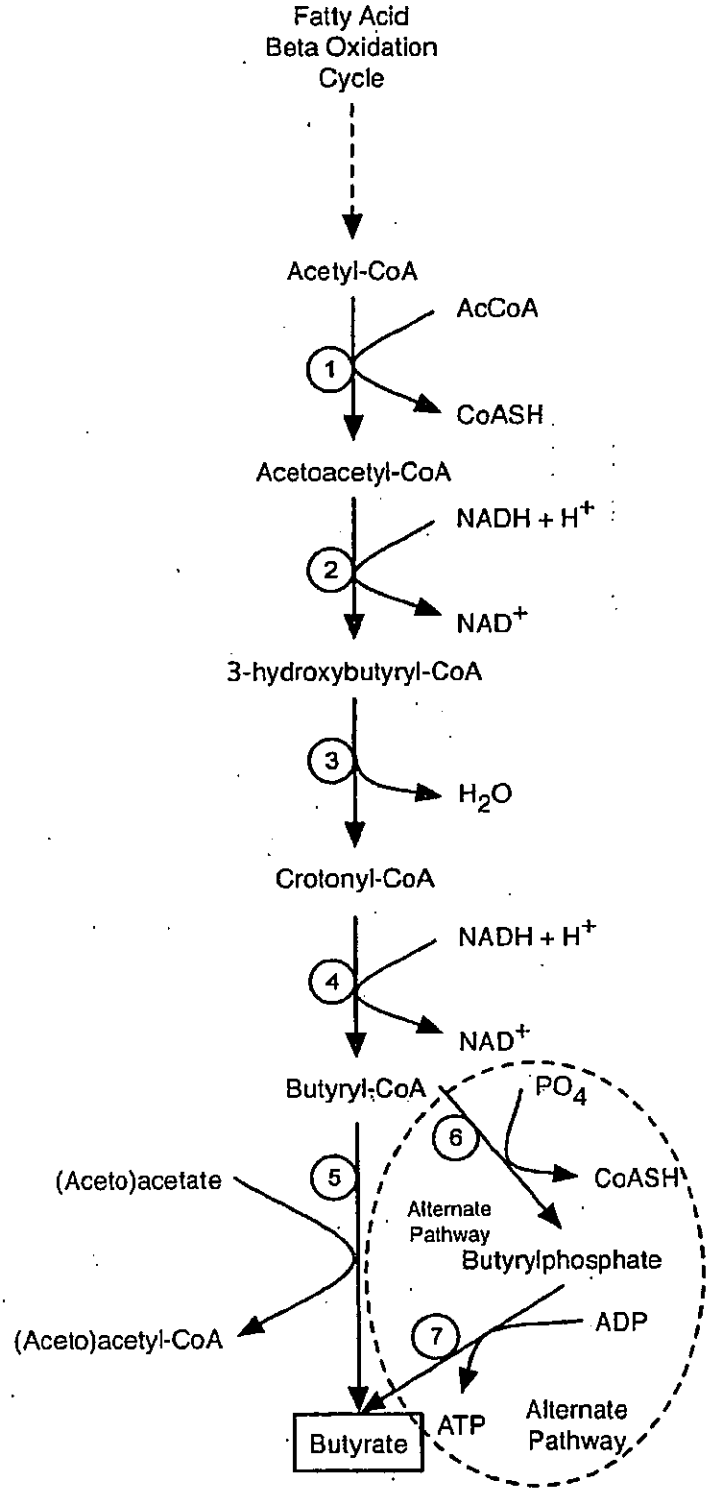

Fatty Acid
Beta Oxidation
Cycle
Acetyl-CoA
AcCoA
1
CoASH
Acetoacetyl-CoA
NADH + H+
2
NAD+
3-hydroxybutyryl-CoA
3
H2O
Crotonyl-CoA
NADH + H+
4
NAD+
Butyryl-CoA
PO4
6
CoASH
(Aceto)acetate
5
Alternate
Pathway
Butyrylphosphate
ADP
7
(Aceto)acetyl-CoA
ATP
Alternate
Pathway
Butyrate

FIGURE 12

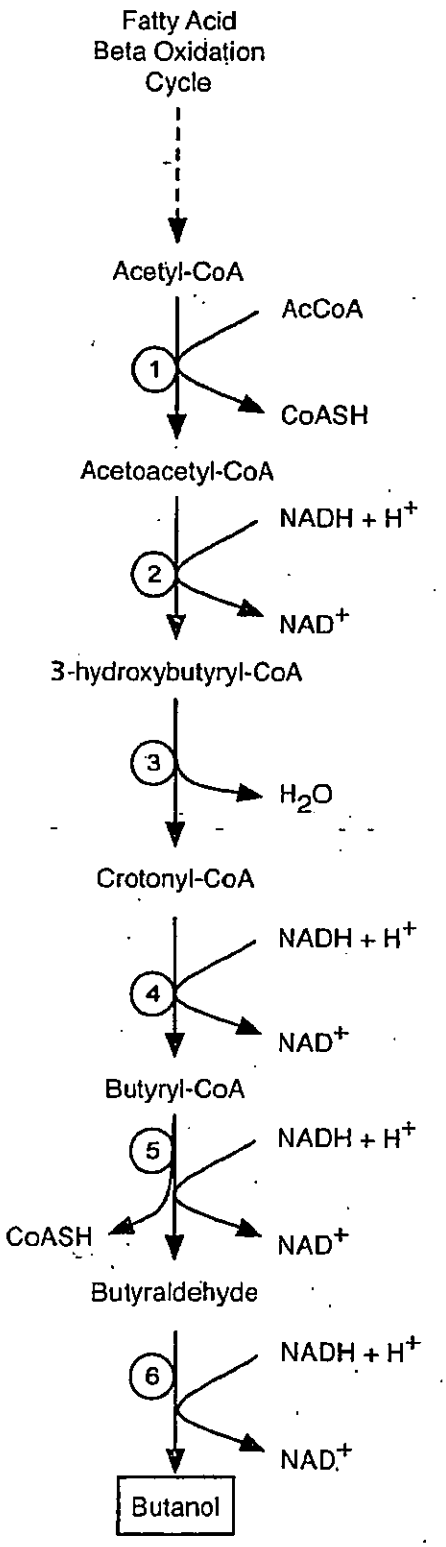

Fatty Acid
Beta Oxidation
Cycle
Acetyl-CoA
AcCoA
1
CoASH
Acetoacetyl-CoA
NADH + H+
2
NAD+
3-hydroxybutyryl-CoA
3
H2O
Crotonyl-CoA
NADH + H+
4
NAD+
Butyryl-CoA
NADH + H+
5
CoASH
NAD+
Butyraldehyde
NADH + H+
6
NAD+
Butanol

FIGURE 13

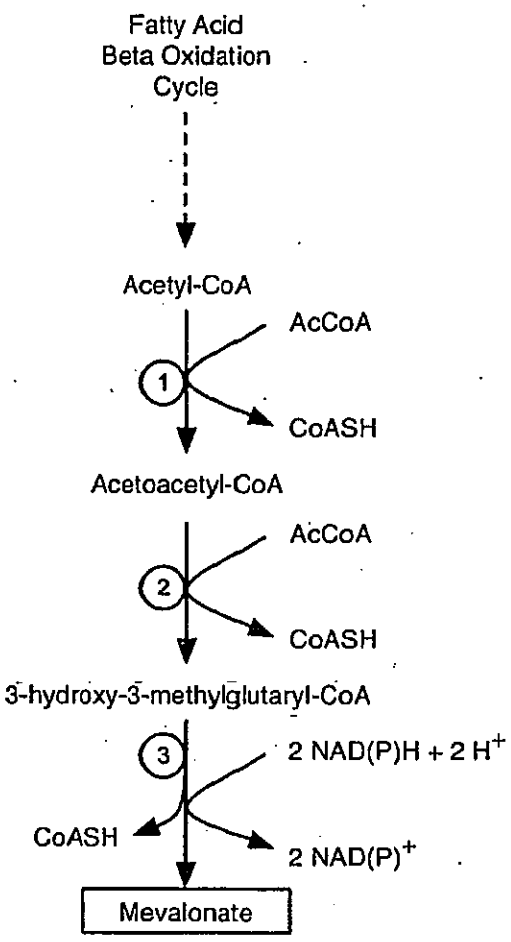

Fatty Acid
Beta Oxidation
Cycle
Acetyl-CoA
AcCoA
1
CoASH
Acetoacetyl-CoA
AcCoA
2
CoASH
3-hydroxy-3-methylglutaryl-CoA
2 NAD(P)H + 2 H+
3
CoASH
2 NAD(P)+
Mevalonate

FIGURE 14

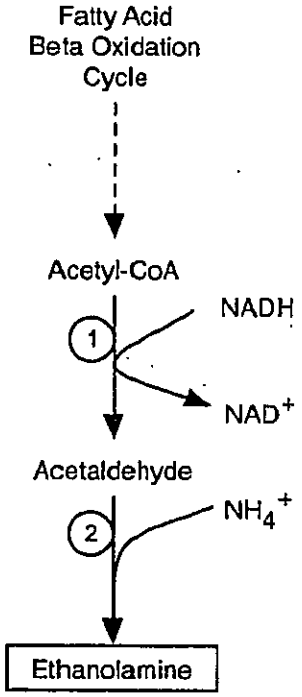

Fatty Acid
Beta Oxidation
Cycle
Acetyl-CoA
NADH
1
NAD+
Acetaldehyde
NH4+
2
Ethanolamine

FIGURE 15