In the LIVER – Lipids follow 5 metabolic pathways

1. Oxidation to CO_2 with ATP production
2. Formation of ketone bodies
3. Biosynthesis of cholesterol & bile salts
4. Biosynthesis of plasma lipoproteins
5. Formation of plasma free fatty acids

1. Oxidation to CO2 with ATP production

- FA - major oxidative fuel in liver
- Free fatty acids (FFA) may be activated, oxidized
- Yields acetyl-CoA & ATP (β oxidation)
- acetyl-CoA oxidized via Krebs cycle to yield ATP (oxidative phosphorylation)

2. Formation of ketone bodies

- Excess acetyl-CoA converted to ketone bodies (KB)
- KB -acetone, acetoacetate,β-hydroxybutyrate

- KB circulated via blood, go to tissues for use as fuel for Krebs cycle
- KB – Transport form of acetyl groups
- KB – can give significant energy to tissues
- Heart – one-third energy provided by KB

3. Biosynthesis of cholesterol & bile salts

- Acetyl-CoA derived from FA & glucose
- It is major precursor for cholesterol biosynthesis
- Cholesterol – precursor of bile salts (required for lipid digestion & absorption)

4. Biosynthesis of plasma lipoproteins

- FA synthesize lipid portion of plasma lipoproteins (LP)
- LP - carry lipids to adipose tissues for storage as TAGs

5. Formation of plasma free fatty acids

- FFA bound to serum albumin & go to heart, skeleton muscles
- Heart, skeleton muscles - absorb & oxidize FFA as fuel

Figure 24-11
Metabolism of fatty acids in the liver.