In the LIVER – Amino acids follow 5 metabolic routes

- Amino acids (AA) enter liver after intestinal absorption are

1. Transported to other tissues
2. Synthesize liver proteins & plasma lipoproteins
3. Undergo deamination & degradation
4. Participate in glucose-alanine cycle
5. Converted to nucleotides & other products

1. Transported to other tissues

- AA may pass into blood and act as building blocks for the synthesis of tissue proteins

2. Synthesize liver proteins & plasma lipoproteins

- Liver constantly renew its own intrinsic proteins (peripheral proteins)
- High turnover rate – avg. half life – a few days
- Liver also site of most of plasma proteins

3. Undergo deamination & degradation

- AA not needed for protein biosynthesis in liver or elsewhere are deaminated , degraded
- Yields

1. acetyl-CoA 2. CAC intermediates

1. Acetyl-CoA may be
   - oxidized via CAC for ATP energy
   - converted to lipids for storage

2. CAC intermediates may be converted to glucose & glycogen (gluconeogenesis)

- Ammonia released by AA degradation is converted to urea by liver (urea cycle)

4. Participate in glucose-alanine cycle

- Liver participate in AA metabolism
- Alanine from muscles go to liver for deamination to form pyruvate
- Pyruvate converted to glucose via gluconeogenesis
- Glucose go to muscle to replenish muscle glycogen stores
- **Glucose-alanine cycle** – smooth out fluctuations in blood glucose levels in periods bw meals
- Blood adequately supplied with glucose

1. after digestion & absorption of CARBS

2. By conversion of liver glycogen into glucose

- But in the period preceding next meals, some muscle proteins are degraded into AA
- AA donate amino groups (transamination) to pyruvate, to form alanine
- Thus alanine transports both pyruvate & NH3 to liver
- In liver, alanine is deaminated, pyruvate converted to glucose & NH3 into urea for excretion
- AA deficit incurred in muscles is made up after next meal from incoming dietary AA

5. Converted to nucleotides & other products

- AA precursors for the biosynthesis of
- Purines
- Pyrimidines
- Porphyrins (A group of heterocyclic organic comp. composed of four modified pyrrole subunits interconnected at their a carbon atoms. Many porphyrins are naturally occurring; one of the best-known porphyrins is heme)
- Hormones
- Other N compounds

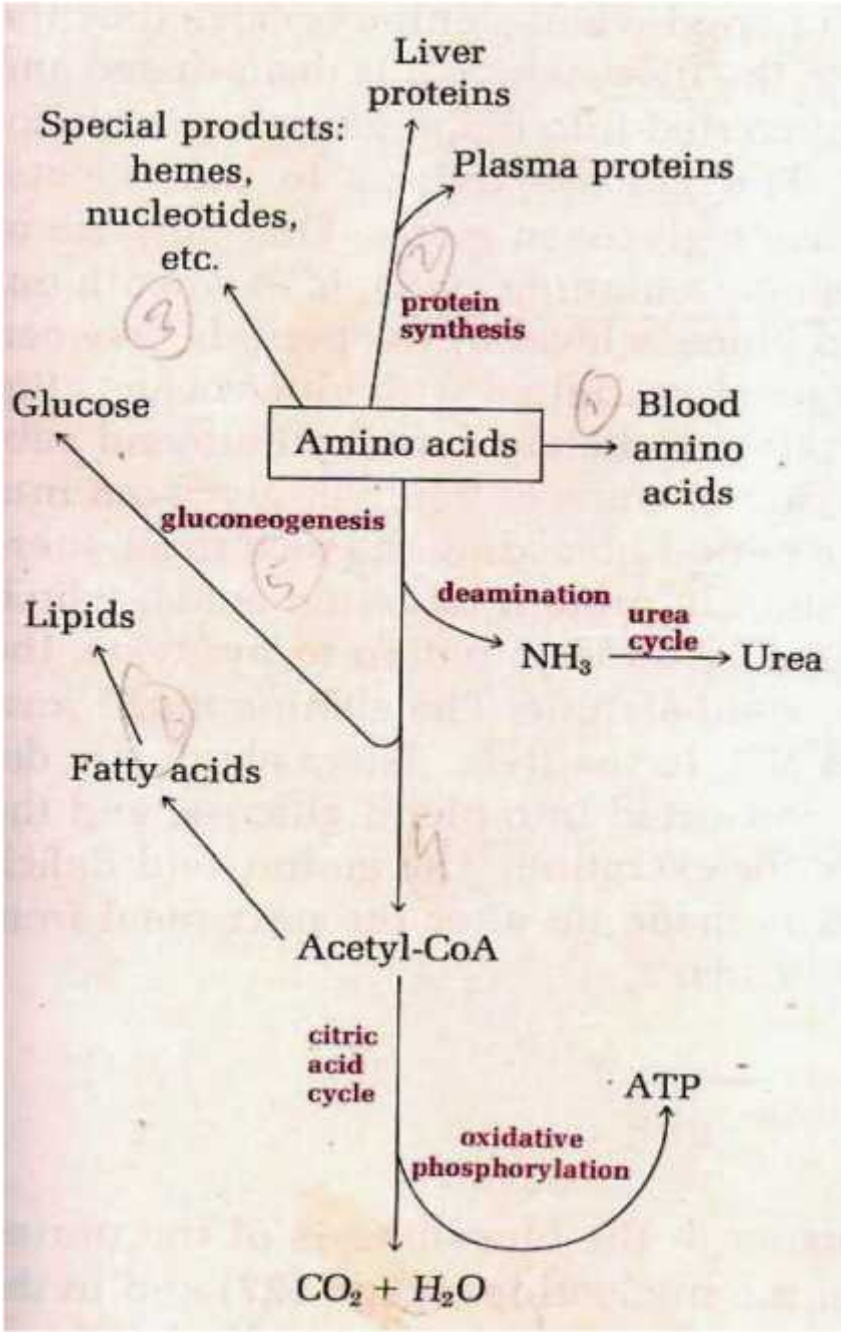

Figure 24-10
Metabolic pathways of amino acids in the liver.