

**General** - non-essential nutrient but contains LA & ALA, essential fatty acids.

- Made of phospholipids, whose components always include glycerol, two fatty acids & phosphate & may contain choline, inositol, serine, or ethanolamine as additional components;
- If foods contain the necessary materials, the liver can make lecithin;
- Lecithin from foods is disassembled by digestion & re-assembled in gut or liver;

## Nutrition

- **Sources:** the cell membranes of all living cells are constructed mainly from phosphatides; unrefined seed oils contain about 1 - 2% lecithin; richest source is soy beans, with 2 - 4% lecithin; soy beans are usual commercial source of lecithin; egg yolks, another rich source of lecithin, have drawback of containing mostly saturated fats;
- **Supplements:** lecithin & phosphatidyl choline capsules; lecithin granules; also present in some multi-nutrient formulations, but in nutritionally insignificant amounts;
- **Absorption** of digested lecithin components from small intestine;
- **Storage:** broadly distributed in the body; concentrated in brain, nervous system & "energy factories" (mitochondria) of heart cells;
- More than 25% of lipids in brain grey matter is phosphatidyl choline;
- More than 10% of lipids in myelin sheath surrounding nerve cells is phosphatidylcholine;
- 50% of lipids in cell membranes—"envelopes" that surround & protect cells—is lecithin;
- Lecithin represents about 25% of the total lipids in blood stream;
- **Metabolism:** liver makes lecithin in amounts that correspond to the amount of cholesterol present in the body;

## Functions of Lecithin

- Has both water-loving and oil-loving parts to its molecules, making it able to dissolve water & lipids (which don't normally mix) into one another;
- Detergent-like property of lecithin allows it to:
- Make cholesterol soluble in the bile;
- Emulsify dietary lipids in the intestine;
- Make fats & cholesterol soluble in watery blood plasma;
- Is a powerful lipotropic factor that prevents fatty infiltration of the liver by discharging fatty compounds from this organ;
- Lecithin is used to make cell membranes & maintain integrity of red blood & all other cells;
- Used to build intra-cellular membranes & maintain integrity of "factories" (organelles) within cells;

- Helps remove cholesterol & bile acids from body through stools;
- Provides choline, the vitamin B-complex factor with high lipotropic activity, that the body uses to make its own lecithin according to its physiological need;
- Dietary lecithin is required for digesting & assimilating dietary lipids from small intestine;
- Provides building materials for body-made phosphatidyl-choline;

### Quantities

- **Individual** optimum needs to be determined for each individual case;
- **Deficiency** from fat-free diet; deficiency of essential fatty acids;
- **Symptoms include:** symptoms of fat-free diet; symptoms of essential fatty acid deficiency; abnormal blood lipids; abnormal nerve and brain functions;
- **Toxicity:** none recorded at levels up to 100 g/day for several months;

### Therapy with Lecithin

- **Lecithin:** high doses (35 g/day) help correct blood lipid dysfunctions, high cholesterol, high triglycerides & atherosclerosis; lower doses (3+ g/day) help prevent gall stones;
- Helps prevent & reverse liver cirrhosis;
- Helpful in some cases of tardive dyskinesia, marked by involuntary jerking of voluntary facial muscles (choline is less effective);
- Helpful in some cases of “Alzheimer’s” characterized by middle-age memory loss, impaired learning, & disorientation;
- May slow down nerve deterioration in multiple sclerotics;
- Source of choline, precursor of the brain transmitter acetylcholine;
- Source of both essential fatty acids (60% omega-6 & 5% omega-3);
- **Choline:** helps reduce high serum cholesterol, high serum triglycerides, atherosclerosis, gall stones, fatty liver & cirrhosis, Alzheimer’s disease, Parkinson’s disease, learning & memory disorders;