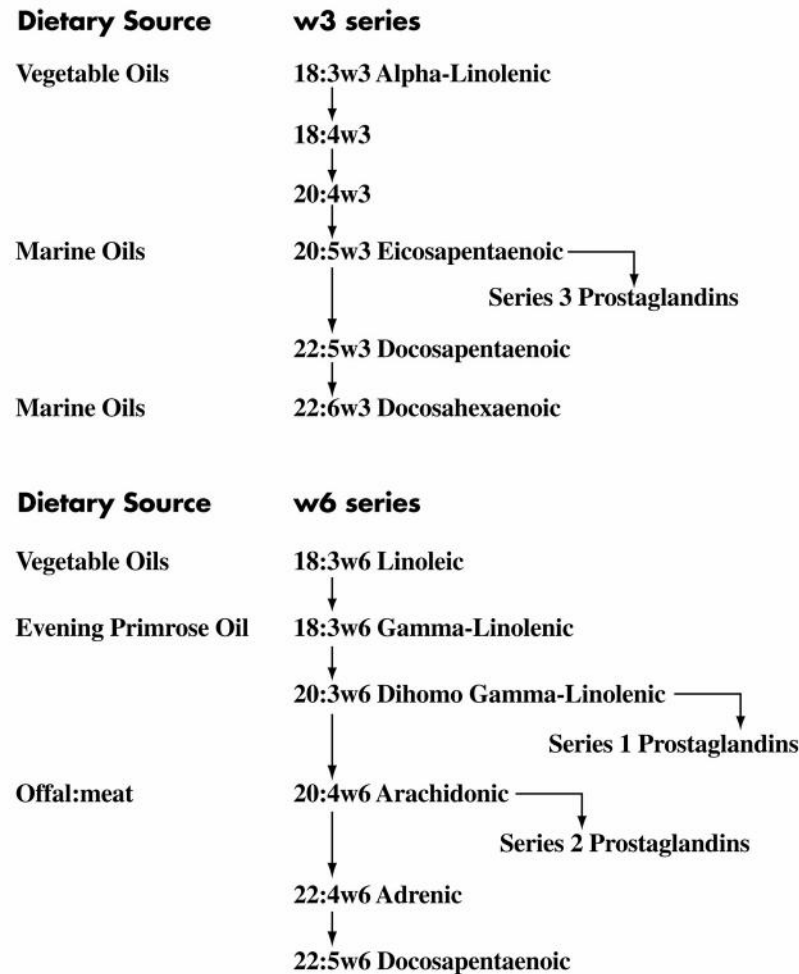


Chart C-1a
Summary of Essential Fatty Acid Conversions & Functions



Clinical Use

Consumption of prostaglandins is useless, because they are destroyed during digestion.

Consumption of supplements of essential fatty acids or their derivatives can bring dramatic improvements in health, through their conversion into prostaglandins in the body.

LINOLEIC ACID (LA)

General: essential fatty acid; omega-6;

- Excess of LA more likely in Western populations than deficiency;
- Precursor for several derivatives including gamma-linolenic acid (GLA), dihomo-gammalinolenic acid (DGLA parent of series-1 prostaglandins), and arachidonic acid (AA, parent of series-2 prostaglandins);

- **History:** LA discovered to be essential for rats in 1929; human essentiality established in 1954; conversion of arachidonic acid to prostaglandins recognized in 1965; prostaglandin metabolism identified in 1970's;

Nutrition

- **Sources:** best: sunflower and sesame seeds; good: fresh safflower, sunflower, sesame oils; poor quality: refined oils; low quantity: processed foods;
- **Supplements:** fresh encapsulated oils (protected from oxidation);
- **Absorption** from intestine;
- **Improved by:** sufficient bile;
- **Antagonized by:** lack of bile;
- **Stability:** destroyed by light (generates free radicals), oxygen (peroxides = rancidity) & heat (increases rate of spoilage by light & oxygen; above 160°C, twisted trans-fatty acids begin to form); frying & deep-frying is very destructive;
- **Storage:** in fat (adipose) cells; in cell membranes; in membranes surrounding intracellular organelles;
- **Excretion:** not excreted; excess is "burned" to generate energy;
- **Metabolism:** converted into derivatives and prostaglandins;

Functions of LA

- Required for cell membrane & intracellular organelle membrane integrity;
- Necessary for production of series 1 (beneficial) prostaglandins;
- Necessary for production of series two (stress-related, detrimental) prostaglandins;
- Involved in regulatory activities in all cells, tissues & organs;

Quantities

- **Measurement:** milligrams; grams;
- **Optimum** (SONA) average ranges not established; estimated 3 - 6% of calories (10 - 20 grams/day);
- **Individual** optimum needs to be determined for each individual case;
- **Minimum** (EC RDA) not yet established; estimated at 1 - 2% of calories (3 - 6 grams/day);
- **Less than RDA:** not common; excess far more likely;
- **Deficiency** of LA from use of fat-free & Pritikin-type diets;
- **Symptoms include:** skin disorders, loss of hair, liver degeneration & fatty deposits in liver, behavioural disturbances, kidney degeneration, glandular atrophy, proneness to infection, poor wound healing, sterility & miscarriage, arthritis, heart & artery disease, growth retardation;
- **Toxicity:** excess LA enhances tumour formation;
- **Reversed by:** vitamin E;

Therapy with LA

- Alleviate symptoms of LA deficiency;
- Provide material for production of LA derivatives in the body of healthy people;
- Provide starting material for series-1 & series-2 prostaglandin production;