It's THE FAT

...the SATURATED FAT

THE BIOCHEMISTRY

3 Basic Types of Fats (Fatty Acids) and Cholesterol

1) **POLYUNSATURATED** (PUFA) – 2 or more double bonds, cis position, biochemically unstable, very oxidizable. Essential amount = 2-4% of total calories. Excess of either = increased inflammation.
   - Omega 3, A Linoleic => DHA and EPA (< 5-9%conversion). Healthy source = greens, seeds/nuts. DPA, DHA and EPA => eicosanoids => prostaglandins. Healthy source = fish, grass-fed herbivores.
   - Omega 6, Linoleic => Arachidonic acid. Healthy source = grass fed herbivores, poultry.
   - Trans – 2 or more double bonds, trans position, biochemically unstable. (Hydrogenated trans fats have the trans bond in a different location than natural trans fats.) Healthy source = animal tissue. CLA – primarily in ruminant animals and dairy fat. Associated with decreased inflammation.

2) **MONOUNSATURATED, OLEIC** (MUFA) – 1 double bond, more stable, less oxidizable than PUFAs. Healthy source = poultry, pork and herbivore fats, olives, macadamia nuts, peanuts.

3) **SATURATED** (SFA) – No double bonds. Very stable, minimal oxidation. Safest fatty acid.
   - Short chain – Butter, coconut oil, palm kernel oil.
   - Medium chain – Human milk, coconut oil, butter.
   - Long chain – Grass-fed ruminant and herbivore fats, organs/offal, palm kernel oil.

CHOLESTEROL (CHOL) – a Sterol (alcohol). Found only in animal tissue, primary component of membranes. More in lean tissue than in adipose. Essential in membranes and hormone synthesis.

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Carmen Ritz, M.S. • Applied Physiologist • 970.946.1038 • Carmen@wildrenz.com

Physiological Dynamics

- Healthy animal fats/organs – Highest levels of Vitamin A (retinol), D3, K2, E, Omega 3 and CLA.
- Aides in, or critical to, the absorption of numerous vitamins and minerals.
- Improves LDL and HDL and their sub fractions.
- Lowers triglycerides (assuming a low carb/sugar intake).
- Primary constituent of our own body fat stores = THE preferred fuel source.
- Dairy, dairy fat, cheese intake – negative correlations with cardiovascular disease (CVD) and CVD progression.

Critical Metabolic Functions (Saturated Fat + Cholesterol)

- ALL cell membranes – 50% saturated when healthy and more rigid structure (ie. smooth skin).
- Anti-oxidative properties (see biochemistry) – protects PUFAs and MUFAs.
- Bone formation, hormone production, immune function, lung surfactant, neural function.
- Vitamin D synthesis, in concert with sunlight (UVB rays) and cholesterol.

Facts for High Fat

- Typical healthy herbivore = 70% fat by caloric weight (approx. 45% SFA, 45% MUFA, 10% PUFA).
- Human milk = 40-50% SFA, 35-40% MUFA, 10-15% PUFA (on average).
- Humans = highly developed protein and fat digestion: HCL, biliary, liver.
- Organs/offal = highest fat and nutrient content, most prized by hunter-gatherers (and my grandmother).
- Safest/healthiest/highest nutrient density caloric source = SFA (#1) MUFAs (#2) + CHOL.

For Optimal Nutrition consider:

70% fats, 20% protein, 10% carbs

(no grains or legumes)

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