Primary hormones (in CAPS) are made by organs by taking up cholesterol * and converting it locally to, for example, progesterone. Much less is made from circulating precursors like pregnenolone. For example, taking DHEA can create testosterone and estrogen, but far less than is made by the testes or ovaries, respectively. Rocky Mountain Analytical® RMALAB.com Changing lives, one test at a time DHEAS (Sulfate) Cholesterol Spironolactone, Congenital **Steroid Pathways** Spironolactone, aging, dioxin adrenal hyperplasia (CAH), exposure, licorice Inflammation ketoconazole (-)Where is it made? Find these Hormones on the DUTCH Complete Adrenal gland 17-hydroxylase 17,20 Lyase 17bHSD Preanenolone 17-OH-Preanenolone Androstenediol DHEA Where is it made? Testes in men, from the ovaries Progestins, isoflavonoids, (-)metformin, heavy alcohol use and adrenal DHEA in women. High insulin, PCOS, hyperglycemia, Where is it made? stress, alcohol PCOS, high insulin, forskolin, IGF-1 Ovaries - less from adrenals Chrysin, zinc, damiana, flaxseed, grape seed 17,20 Lyase 17-hydroxylase **PROGESTERONE TESTOSTERONE** extract, nettles, EGCG. Androstenedione ketoconazole, metformin, anastrazole Etiocholanolone Inflammation, excess **Epi-Testosterone** 5a-DHT adipose, high insulin, a- Pregnanediol b- Pregnanediol forskolin, alcohol 5b-Androstanediol More Cortisone: Hyperthyroidism, Where is it hGH, E2, ketoconazole, quality sleep, made? *5a-Reductase magnolia, scutellaria, zizyphus, Adrenal gland 5a-Androstanediol Where is it made? **Androsterone** testosterone, citrus peel extract 5a-Reductase is best known because it makes Ovaries - lesser androgens like testosterone more potent. It is also amounts elsewhere responsible for metabolizing progesterone and Inflammation, visceral obesity, CORTISOL 11b-HSD Cortisone from DHEA/ cortisol. If up-regulated, it may cause high androgen DHEA, forskolin, alcohol Testosterone. (active) (inactive) symptoms in men (thinning hair, prostate) and women (as in PCOS, thinning hair, acne, facial 17bHSD **ESTRADIOL (E2)** Estrone (E1) hair growth). 5b-Metabolites are less androgenic More Cortisol: Hypothyroid. licorice, grapefruit, inflammation, (weaker). visceral obesity, high insulin, 5a-Reductase is increased in particular by: Phytoestrogens, licorice, excess sodium High insulin and obesity. progestins, tamoxifen Cortisol Metabolism/Clearance 5a-Reductase may be decreased by: Saw palmetto Grapefruit, noni & pomegranate juice, nettles, pygeum, EGCG, progesterone, zinc, Cortisol is metabolized by 5a/5b-reductase (and 3a-HSD) to a/b-THF & THE for excretion. CYP peppermint oil, antifungals, valerian medications like Finasteride. This process is particularly increased in obesity, high insulin and hyperthyroid. It may be slowed in cases of hypothyroidism, anorexia or poor liver function. 5b-Reductase may be affected by some of the above listed things as well (often to a lesser degree). 17bHSD Estriol (E3) 16-OHE 1 CYP-1A1 Hops, bioflavonoids, grapefruit Other factors affecting the production of primary reproductive and adrenal hormones: Increased Cortisol: stress, inflammation, Cushing's Disease, obesity COMT 4-OHE1 Decreased Cortisol: glucocorticoid use, opioid use, Addison's Disease, Accutane, chronic marijuana use Increased DHEA: PCOS, acute stress, Bupropion (Wellbutrin), Alprazolam (Xanax), ADD meds Cruciferous veggies, DIM (Diindolylmethane), Decreased DHEA: aging, rapid weight loss, Venlafaxine/Mirtazapine, opioids, glucocorticoids, I-3-C (Indole-3-Carbinol), berries Rocky Mountain Analytical hormonal birth control, antipsychotic meds, estrogens, diabetes meds Increased Testosterone: PCOS, HCG, HGH, L-Dopa, Climiphene Citrate (Clomid) Methylation of 2-OH/4-OH estrogens is slowed with certain Decreased Testosterone: obesity, opioids, hormonal birth control, acute illness, aging, high insulin, steroid use genetic variants (MTHFR, COMT) Increased Estrogens: PCOS, inflammation, pregnancy, DHEA/testosterone supplementation Decreased Estrogens: hormonal birth control, ovarian failure (menopause), opioids, anorexia, underweight COMT 2-OHE1 2-MeOE1 Increased Progesterone: pregnancy, pregnenolone supplementation (increases urine progesterone metabolites, not actual circulating progesterone), Vitex (chaste tree berry) Decreased Progesterone: hormonal birth control, stress, high insulin, opioids, NSAID use >10 days, anovulation, Magnesium (Mg deficiency induced by corticosteroids, estrogen, luteal phase defect, high prolactin, underweight, hypothyroid, hormonal IUD (Mirena) sulfonamides, acid blockers, thiazide diuretics, coffee, alcohol, tamoxifen) Methyl Donors (SAMe, B Vitamins, TMG, Choline, Folate, Methionine) Information on this chart is for educational purposes only and is not a suggestion for supplementation with any of the listed items. References available upon request.