

Nurturing the microbiome: using food as medicine to manage PCOS

What is the significance of the gut microbiome?

The past few years has brought a paradigm change in our view of what a human actually is. Humans are the sum of the human genome and its manifestations, along with that of the more than 100 trillion microbes sharing our bodies, greatly outnumbering our own genome complement by an order of 150times... with the human gut microbiome acknowledged as the most complex ecosystem ever discovered. The metabolic functions which the gut microbiome controls are vast, including the production of vitamins, amino acid synthesis, bile acid transformation, and the maintenance of essential structural, protective, and metabolic functions critical to the optimal state of the body. This includes the production of short chain fatty acids (SCFA) from the fermentation of resistant carbohydrates. These SCFA's are critically involved in energy metabolism, appetite regulation, play a key role in glucose metabolism, and are immunomodulatory, playing an essential part in the development and support of the immune system.

How does diet impact the microbiome and health in Pcos women?

A high fat, high simple sugar diet impacts the gut microbiota, causing dysbiosis, gut barrier disruption, endotoxemia, and local gut and systemic inflammation. As the normal tight junctions between the cells comprising the single layer protective barrier are compromised, "leaky gut" syndrome develops, permitting the passage of lipopolysaccharides (LPS) from the overgrowth of pathological Gram negative bacteria to cross the gut barrier. Inflammatory cytokines, systemic inflammation, insulin resistance, increased levels of IGF 1 and testosterone, and anovulation-all the classic symptoms of PCOS, occur. The hypothesis published by Professor Tremellen, proposing that the standard Western diet induces and exacerbates PCOS, was confirmed in January 2016 by Dr. Zhu. His published research conclusively showed that women with PCOS, across the entire weight spectrum, have higher systemic levels of LPS compared with matched women without PCOS.

What diet best improves the status of the microbiome... and Pcos?

Based on scientific evidence, the best diet for women with PCOS

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begins with a vegan diet composed of an extremely high carbohydrate percentage of 70%, with low protein and fat. The carbohydrates must be primarily organic, whole foods and plant based, heavily comprised of resistant starch from whole, unprocessed grains, beans and lentils, root vegetables, leafy greens, fermented vegetables, and a small amount of raw nuts and seeds. Initially, fruit is very limited, as would be flours. No dairy, processed grains, animal products, or sweets, real or artificial, can be eaten. A great variety of vegetables is needed, to provide a large array of phytonutrients, along with supplemented probiotics and Omega 3. In 2014, Falluca published a study utilizing this diet with Type 2 Diabetics with significant benefit shown within one month. Significant reductions were seen in the fasting blood sugar, HgbA1C, lipid profile, IGF 1, body weight, BMI, percent body fat, and blood pressure. Hence, the optimal diet for women with PCOS is one which restores and nurtures the gut microbiome, re-establishes gut wall integrity, contains a great diversity of phytonutrients, reduces the production of LPS, and thereby lowers systemic inflammation, insulin, and IGF 1. The high resistant starch, high carbohydrate diet proposed can support the re-establishment of metabolic homeostatis and ovulatory function for women with PCOS.

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Conflict of interest

The author declares no conflict of interest.