

Hormone Signatures of Women in Long-Term Ketosis



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This study aims to investigate the unique hormone signatures of women in long-standing ketosis, focusing on understanding how this metabolic state impacts female-specific hormone panels such as oestrogen, progesterone, testosterone, luteinizing hormone and follicle-stimulating hormone, in both healthy individuals and those with metabolic dysfunction and hyperinsulinemia, a condition closely linked to metabolic disorders. By exploring this novel research area, we aim to establish foundational knowledge that will contribute to the biological and biochemical understanding of women's health and empower individualised healthcare strategies, guiding orthomolecular and nutritional interventions for metabolic diseases in women.

Research Rationale and Public Health Impact:

Women face distinct challenges related to hormone balance, including conditions like **polycystic ovary syndrome (PCOS), endometriosis, breast, uterine and ovarian cancer, and infertility**. However, comprehensive studies of the effects of sustained long-term ketosis on female hormones remain understudied. Our previous research has shown a ketogenic lifestyle improves insulin sensitivity and metabolic markers [1, 2, 3], but its specific impact on female hormones in healthy and hyperinsulinemic populations is poorly understood. Establishing hormonal profiles in long-standing ketosis and in hyperinsulinaemia will provide critical reference data for medical professionals and researchers.

How to fund FYG research:

Our study addresses an **urgent** need for women's health research in metabolic states such as being in long term ketosis versus not in ketosis as well as endocrinology, which aims to:

- 01** Improve the understanding of hormone panels in long-term ketosis offering actionable insights into the ketogenic diet's role in female hormonal health.
- 02** Nutritional therapeutic management of hyperinsulinemia and women's health conditions such as PCOS, endometriosis, breast, uterine and ovarian cancer, and infertility.

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1. Cooper, I.D.; Kyriakidou, Y.; Edwards, K.; Petagine, L.; Seyfried, T.N.; Duraj, T.; Soto-Mota, A.; Scarborough, A.; Jacome, S.L.; Brookler, K.; et al. Ketosis Suppression and Ageing (KetoSAge): The Effects of Suppressing Ketosis in Long Term Keto-Adapted Non-Athletic Females. *Int. J. Mol. Sci.* 2023, 24, 15621. DOI: <https://doi.org/10.3390/ijms242115621>

2. Cooper, I.D.; Kyriakidou, Y.; Petagine, L.; Edwards, K.; Soto-Mota, A.; Brookler, K.; Elliott, B.T. Ketosis Suppression and Ageing (KetoSAge) Part 2: The Effect of Suppressing Ketosis on Biomarkers Associated with Ageing, HOMA-IR, Leptin, Osteocalcin, and GLP-1, in Healthy Females. *Biomedicines* 2024, 12, 1553. DOI: <https://doi.org/10.3390/biomedicines12071553>

3. Cooper I.D., Sanchez-Pizarro C., Norwitz N.G., Feldman D., Kyriakidou Y., Edwards K., Petagine L., Elliot B.T. and Soto-Mota A. (2023) Thyroid markers and body composition predict LDL-cholesterol change in lean healthy women on a ketogenic diet: experimental support for the lipid energy model. *Front. Endocrinol.* 14:1326768. doi: 10.3389/fendo.2023.1326768