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Letter to Editor

Oxidative Stress Induced by Thermally Degraded Oils: Implications for Polycystic Ovary Syndrome and Female Fertility

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Dear Editor

We would like to express our concern regarding the potential effects of consuming oxidized oils, particularly those subjected to repeated heating during frying, on the development and progression of reproductive disorders in women.

Polycystic ovary syndrome (PCOS) is a prevalent endocrine disorder characterized by hormonal dysregulation, anovulation, and hyperandrogenism. It affects approximately 9.2% of women globally and exhibits a prevalence ranging from 4.4% to 19.5% in the Iranian population [1, 2]. This syndrome may be associated with the occurrence of metabolic disorders, dyslipidemia, endometrial cancer, diabetes mellitus, and cardiovascular diseases [3]. Oxidative stress, defined as an imbalance between reactive oxygen species and antioxidant defenses, is a key factor in the pathophysiology of PCOS, primarily due to its detrimental effects on ovarian follicles and oocyte quality [4].

Thermal degradation of oils during high-heat cooking generates harmful substances, including hydroperoxides, aldehydes, ketones, and free radicals, that intensify oxidative stress and inflammation [5]. These oxidized oils are common in modern diets rich in fried and processed foods, potentially exacerbating systemic oxidative damage associated with PCOS severity.

In patients with PCOS, elevated oxidative stress is linked to increased insulin resistance and chronic inflammation, which further disrupt ovarian function and fertility. Given that oxidized oil consumption contributes to oxidative stress, it may represent an underappreciated environmental factor aggravating PCOS and its reproductive consequences [6].

Despite this plausible connection, direct clinical evidence linking oxidized oil intake to PCOS remains limited. Therefore, comprehensive clinical and epidemiological studies are urgently needed to clarify this relationship and guide effective dietary recommendations and public health interventions.

In summary, reducing exposure to oxidized oils is a promising modifiable factor to alleviate oxidative stress and improve outcomes in PCOS. Raising awareness and implementing regulatory measures could enhance prevention and management strategies for this prevalent syndrome.

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