NUTR 321 Lifecycle Nutrition #1 Preconception Research

Instructions: Chapters 2 and 3 will give you background information on each of the following conditions. Once you have reviewed that material, visit the following websites to find out additional information and resources that could be used to answer these questions. Please provide a thoughtful paragraph to answer the questions below. **Each question is worth 2 points, 10 points total.**

1. **Supplements and herbal products** are sometimes used to treat PMS symptoms. Evaluating research on the results of supplements/herbs to treat PMS symptoms is important for women to make an informed decision regarding their use. Chasteberry is an herbal product that is listed in the text as a possible treatment for PMS. Go to <http://www.aafp.org/afp/2005/0901/p821.html> to see an overview of the research. What recommendations for chasteberry use would you recommend for women with PMS? What about other supplements and herbal products?

For women experiencing PMS symptoms, **chasteberry is supported by current literature as a possible treatment for cyclical breast discomfort and other premenstrual syndrome symptoms**, including breast pain or tenderness, edema, constipation, irritability, depressed mood, anger, and headache. Clinical trials have shown significant improvement in these symptoms, with one high-quality study reporting over half of women experienced a 50% or greater reduction in symptoms with good patient acceptance and mild side effects. Chasteberry is generally well-tolerated, with reported minor adverse effects such as gastrointestinal complaints, dizziness, and dry mouth, but caution is advised with concomitant use of dopamine agonists or antagonists. It is **contraindicated during pregnancy and its use during lactation is controversial and generally discouraged** due to insufficient evidence for milk production enhancement. Regarding other supplements and herbal products, the available evidence does not support firm conclusions on the efficacy and safety of a wide variety of these products for treating PMS symptoms. However, **supplementation with vitamin B6 (100 mg/day) and calcium (500 mg/day) appears to help relieve certain PMS symptoms**. While some herbal remedies like St. John's wort and Ginkgo biloba are sometimes recommended for specific symptoms, a broad endorsement for their effectiveness and safety is not supported.

1. **Female Athlete Triad**: Briefly explain why this condition can cause problems with infertility and identify two nutrition strategies that you feel would be beneficial for very active women to consider.

Female Athlete Triad can cause fertility issues because:

Female Athlete Triad can cause fertility issues because it often leads to chronic energy deficits when very high levels of physical activity are combined with inadequate caloric intake. This energy imbalance disrupts the normal secretion of hormones like **luteinizing hormone (LH),** follicle-stimulating hormone (FSH), and estrogen, which are crucial for reproductive function. The consequence is often functional hypothalamic amenorrhea (absence of menstrual cycles) or anovulatory cycles (menstrual cycles without ovulation), directly impairing a woman's ability to conceive.

List two nutrition suggestions that may assist with fertility:

1. Achieving and maintaining an adequate energy balance by ensuring caloric intake sufficiently covers their high energy expenditure. This is fundamental for restoring normal hormonal function and reversing conditions like functional hypothalamic amenorrhea.
2. Adopting a healthy dietary pattern rich in antioxidants, vitamins, and minerals from diverse food sources. This helps protect reproductive cells from oxidative stress, and specifically, adequate iron intake can reduce the risk of ovulatory infertility, while sufficient calcium and vitamin D support overall health, including bone density which can be impacted by hormonal imbalances.
3. **Diabetes/PCOS**: Go to <https://www.cdc.gov/diabetes/risk-factors/pcos-polycystic-ovary-syndrome.html?CDC_AAref_Val=https://www.cdc.gov/diabetes/basics/pcos.html> for more information. What is the relationship between diabetes and PCOS? Are the dietary recommendations for diabetes and PCOS compatible? Explain.

The relationship between diabetes and Polycystic Ovary Syndrome (PCOS) is significant, as **more than half of women with PCOS develop type 2 diabetes by age 40**, and the condition also increases the risk of gestational diabetes. This elevated risk is primarily driven by **insulin resistance, a key characteristic of PCOS** where the body produces insulin but struggles to use it effectively, thereby increasing blood sugar levels. The metabolic changes associated with PCOS further contribute to abdominal fat storage, which exacerbates insulin resistance and high blood insulin levels. Fortunately, the dietary recommendations for managing both PCOS and diabetes are largely compatible: a primary goal for PCOS treatment is to **increase insulin sensitivity through healthy dietary patterns, weight loss, and regular exercise**, with even a modest 5% weight reduction shown to improve insulin sensitivity and normalize blood glucose and hormone levels. Likewise, the nutritional management for type 2 and gestational diabetes centers on **blood glucose control, weight management, and physical activity**, advocating for diets that emphasize **low-glycemic-index, high-fiber foods** such as whole grains, fruits, vegetables, lean proteins, and low-fat dairy, while minimizing added sugars and refined carbohydrates. Both conditions benefit from **individualized eating and exercise plans** that aim to achieve and maintain a healthy body weight and enhance the body's response to insulin.

1. **Celiac Disease & Infertility**: Go to <https://www.beyondceliac.org/celiac-disease/related-conditions/infertility/> to read more about the research and newer findings about celiac disease and infertility in both women and men. Summarize what you learned. What new fact(s) surprised you about this connection?

Infertility is defined as the inability to conceive after at least one year of trying, or experiencing repeat miscarriages. While studies on the link between celiac disease and infertility have shown conflicting results, recent research underscores that **undiagnosed celiac disease is a critical consideration for reproductive problems**. In women, undiagnosed celiac disease is associated with a higher risk of miscarriages (11 more per 1,000 pregnancies), stillbirths (1.62 more per 1,000 pregnancies), and a reduced chance of conception (25 fewer pregnancies per 1,000 in the two years prior to diagnosis). It also increases the risk of preterm birth, spontaneous miscarriage, polycystic ovarian syndrome, and endometriosis. For men, untreated celiac disease can lead to gonadal dysfunction and issues with sperm morphology, which have been observed to improve after adopting a gluten-free diet. The proposed mechanisms for these reproductive issues include malabsorption-induced deficiencies of vital nutrients such as zinc, folate, and iron, as well as the direct effects of inflammation. Typically, reproductive functions normalize once celiac disease is stabilized with a nutritionally adequate gluten-free diet. A surprising fact from the sources is the **specific quantification of increased miscarriages, stillbirths, and reduced pregnancies in undiagnosed women**. Equally surprising is the recommendation by the National Institute for Health and Care Excellence (NICE) in the United Kingdom for **celiac disease testing in women with unexplained reduced fertility or recurrent miscarriage**, and that an estimated 83% of celiac disease cases in the U.S. remain undiagnosed, suggesting many related infertility issues could be missed.

1. **Phenylketonuria**: Go to <http://depts.washington.edu/pku/about/diet.html> to learn more about the special diet for this condition. Summarize what you learned. What would be the biggest challenge(s) you would have if you were following this diet?

The special diet for **Phenylketonuria (PKU)** involves consuming a **phenylalanine-free medical formula** as its central component, supplemented with carefully measured amounts of fruits, vegetables, and low-protein breads, pastas, and cereals, some of which are specially manufactured. This diet strictly **eliminates high-protein foods** such as milk, dairy products, meat, fish, chicken, eggs, beans, and nuts, as these contain high levels of phenylalanine (phe), which would accumulate to toxic concentrations in individuals with PKU due to a lack or deficiency of the enzyme phenylalanine hydroxylase. The phenylalanine-free formula provides essential protein, vitamins, minerals, and calories to ensure nutritional adequacy without elevating blood phe levels. This **lifelong dietary adherence** is crucial to prevent severe intellectual disability, neurological disorders, and other problems, as research shows that even adults who previously stopped the diet experience improved attention span, concentration, and memory upon returning to it. If I were following this diet, the biggest challenges would likely be the **expense and potential unpalatability** of the specialized formula and low-protein foods, the **social isolation** caused by highly restricted food choices, and the **difficulty in consistently adhering to such a strict regimen** due to its demands on meal planning, preparation, and careful monitoring of phenylalanine intake.