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Recommended Citation
doi: https://doi.org/10.57709/30445023

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NAVIGATING POTENTIAL NUTRIENT DEPLETIONS IN COLLEGE WOMEN TAKING BIRTH CONTROL PILLS AND CREATION OF A BOOKLET GUIDE “EAT FOR YOUR HORMONES”

By

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A Master’s Project Submitted to the Graduate Committee
in the Department of Nutrition at Georgia State University in Partial
Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

ATLANTA, GEORGIA
2022
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Introduction

Nearly all women use contraception at any given time in their lifetime.\(^1\) In 2015-2017, 64.9% of the 72.2 million women aged 15 - 49 were using contraception, and the oral contraceptive (OC) pill accounted for 14% resulting in the most prescribed form of contraceptive in the U.S.\(^1,2\) Most women take oral contraceptive pills to prevent pregnancy; however, 14% use them for non-contraceptive purposes.\(^1,2\) A US college students survey from the fall of 2021 showed that the most common method of birth control among college students is the male condom, followed by the birth control pill.\(^3\) According to Statista, 37% of women of reproductive age in the US used oral contraceptives, especially among women aged 18 to 25.\(^3\) While the pill benefits and empowers women to decide whether to have a child and work outside their homes, women often do not have access to resources to reduce the potential risks associated with the pill. Physicians and other healthcare professionals should be aware of more nutrition risks than commonly understood while on the OC to treat patients and clients better.

Methods

This literature review used public data on contraceptive status among women aged 15-49 in the US, a women’s normal cycle function, the birth control pill (i.e., side effects), potential nutrition implications, mechanisms by which the pill may deplete specific vitamins and minerals, and general recommendations. The booklet was drafted and designed using Canva, and all the information included came from the literature review. The booklet was divided into four sections: part I -“The Funny Business of the Pill,” this section talks about statistics and potential side effects; part II – “A Woman’s Cycle,” where the leading hormones are explained and graphs of the cycle are displayed; part III- “Potential Nutrition Implications while on the Pill” (table listing vitamins and minerals that may be depleted by the pill); and part IV- “General
Recommendations” that includes food sources with nutrients that may be depleted by the pill, seed cycling, and how to build a harmonious plate. At the end of the booklet there is a list with the different birth control methods and a checklist to provide a call to action in college women.

The booklet is to be used as a resource at universities providing female college students with essential information to navigate their hormones nutritionally in conjunction with their healthcare providers. The booklet will be found at the Georgia State University Student Center, Nutrition Department, Rec Center, Student Nutrition Services, and clinic. The guide will eventually be promoted through social media, doctors’ offices, and pantries. See Appendix to see the booklet.

**Types of Oral Contraceptives**

There are three types of oral contraceptive pills: combined estrogen-progesterone, progesterone only, and the continuous or extended use pill.\(^2\,4\,5\,6\) The combined hormonal pill is the most prescribed; however, if there are women who have adverse reactions to synthetic estrogen, they will take the progestin-only pill. Progesterone is the hormone that prevents pregnancy, and the estrogen component controls menstrual bleeding.\(^6\) Hormonal contraceptives have multiple biologic effects.\(^2\,4\) The primary mechanism of action is the inhibition of follicular development, ovulation, and consequently, corpus luteum formation.\(^6\) Moreover, it is involved in cervical mucus changes that inhibit sperm penetration.\(^6\) These hormonal compounds suppress gonadotropin levels in the hypothalamus and central nervous system (CNS).\(^2\,4\,7\)

**A Typical Woman’s Cycle**

Women have a long reproductive lifespan with an average of thirty-six years from menarche (8.5-13 years) to menopause (around 51 years).\(^8\,9\) Puberty begins with breast development, followed by pubic and axillary hair growth.\(^8\,10\) Menstruation involves a rhythm of
hormones rising and falling throughout the days in a cycle. When the hormones are balanced, there is a flow, and no significant problems occur.\textsuperscript{2,4,11,12} The typical menstrual cycle can last twenty-eight days in 10 to 15 percent of women, but it can range from twenty-six to thirty-six days.\textsuperscript{2,4,12} Cycles are unique to every woman; some may last longer and others shorter than twenty-eight days.\textsuperscript{2,4,12} The latter can be considered normal if the cycles are regular.\textsuperscript{2,4}

The goal of the menstrual cycle is to develop and release a mature egg for fertilization.\textsuperscript{2,4,11,12} The first day of a period, where blood is visible, marks the beginning of the menstrual cycle.\textsuperscript{2,4,12} The bleeding happens when estrogen and progesterone drop, which triggers the lining of the uterus, the endometrium, to shed.\textsuperscript{2,4,11,12} A typical bleeding occurs from day one to approximately day seven.\textsuperscript{2,4,12} The decline of estrogen and progesterone stimulates the hypothalamus in the brain to release Gonadotrophin-releasing hormone (GnRH). This enables the pituitary gland to release follicle-stimulating hormone (FSH).\textsuperscript{2,4,13,14} FSH stimulates the growth of the follicles in the ovaries to get an egg ready for ovulation.\textsuperscript{13} Estrogen begins to rise around day eight causing slight changes in the body, including pronounced curves and fuller lips.\textsuperscript{2,4} Around days nine to ten, testosterone increases, which elevates libido before ovulation.\textsuperscript{2,4,12}

Estrogen is the most dominant hormone in the first half of the cycle. It spikes around days twelve through fourteen to trigger the release of luteinizing hormone (LH). LH stimulates the ovaries to release a mature egg marking the beginning of the ovulatory phase.\textsuperscript{2,4,11,12,15} Once the egg ruptures the follicle, the egg travels down the fallopian tube. If fertilized by sperm, it implants in the endometrium or slowly dissolves and passes out of the body with the uterine lining during menstruation.\textsuperscript{2,4,12,15,16} The ruptured follicle becomes the corpus luteum, releasing progesterone, the hormone that helps the body prepare for pregnancy. Progesterone is the most
prominent hormone in the luteal phase from days fifteen through twenty-eight of a cycle and peaks around day twenty-one.\textsuperscript{2,4} If the egg is not fertilized, all hormones drop, and the menstrual cycle starts again.\textsuperscript{2,4,12,15} However, if the egg is fertilized, it will be implanted in the endometrium, and those hormones stay elevated during pregnancy.\textsuperscript{2,4,11,12,15}

**A Woman’s Cycle on Oral Contraceptives**

The menstrual cycle while taking birth control has a significant impact on hormones.\textsuperscript{2,4,17} Most birth control pills deliver a hefty dose of synthetic estrogen and progesterone throughout the month except for a week when a placebo/sugar pill is given.\textsuperscript{2,4} The increased daily amount of synthetic hormones suppresses the pituitary from releasing FSH and LH, which ultimately prevents ovulation.\textsuperscript{2,4,17,18} The brain then senses more than enough hormones circulating in the body, diminishing the signal to produce more.\textsuperscript{2,4,17} The latter results in a lack of communication between the brain, the pituitary, and the ovaries preventing natural rhythm and communication which affects hormonal balance.\textsuperscript{2,4,17,18}

**Hormones Involved in the Cycle**

There are many hormones involved in the internal processes of the body. However, this review will only mention the major ones affected by the birth control pill.\textsuperscript{2,4} Water and fat-soluble hormones are the two main hormonal groups in the body. Fat or steroid hormones are made from cholesterol, including pregnenolone, estrogen, progesterone, testosterone, cortisol, and dehydroepiandrosterone (DHEA).\textsuperscript{2,4} The water or non-steroid hormones are made of amino acids and bind to receptor proteins on cell membranes, activating enzymes inside a cell.\textsuperscript{2} Hormones in this group include thyroid hormone (T4 & T3), insulin, leptin, and oxytocin.\textsuperscript{2,4} The previously mentioned hormones have an intricate communication system and contain specific functions that target organs.
Potential Side Effects of Oral Contraceptives

Common hormone imbalances include too much or too little estrogen, progesterone, cortisol, thyroid hormone, and testosterone. It only takes one hormone out of balance to throw the whole system off.\textsuperscript{2,4} Hormone imbalances are multifactorial; the latter can occur with the consumption of hormonal medications like the OCs.

OCs come with various potential side effects, including a mild increase in blood pressure in long-term contraceptive users, especially those with genetic predisposition and smokers.\textsuperscript{18} Furthermore, OCs may decrease glucose tolerance and increase the incidence of lipid metabolism disorders, cholecystitis, and cholelithiasis.\textsuperscript{2,18,19} Liver disease and blood coagulation may occur with long-term use of OCs, which may increase thrombosis risks and pulmonary embolism.\textsuperscript{18} There is a correlation between contraceptive use and cerebrovascular disorders, myocardial infarction, weight gain, digestive issues, skin issues, mood disruption, low libido, vaginal dryness, chronic infection, and breast tenderness.\textsuperscript{2,20,21} Moreover, there is may be an increase in the risk of breast, cervical, and liver cancers.\textsuperscript{2} The risks associated are higher with age and years of pill use.\textsuperscript{18}

Potential Nutrition Implications

Potential nutrition implications may include fluid retention and decreased folate, vitamin B2 (riboflavin), vitamin B6 (pyridoxine), vitamin B12, vitamin C, vitamin E, magnesium, selenium, and zinc.\textsuperscript{22} OCs may lower antioxidants such as coenzyme Q10 and vitamin E (alpha-tocopherol).\textsuperscript{2,23} Dietary antioxidants are protective agents that counteract oxidative stress to protect cells.\textsuperscript{2,23}
Sex hormones have been shown to interfere with the renin-angiotensin-aldosterone system. First, estrogen stimulates the production of angiotensinogen, increasing levels of angiotensin and aldosterone, causing sodium retention. Second, progesterone is a potent aldosterone antagonist that acts on the mineralocorticoid receptor to prevent sodium retention. In combined OCs, progestogens lack anti-mineralocorticoid and antiandrogenic activity, which cannot counteract the sodium-retaining effect of the ethinylestradiol component, increasing fluid retention, which can promote symptoms such as edema.

Mechanisms by which the pill decreases specific vitamins and minerals vary. Folate, a water-soluble B vitamin, is essential in enzymatic reactions involved in amino acid metabolism, purine and pyrimidine synthesis, and DNA methylation. The lack of this vitamin can create deficiencies that lead to reduced DNA synthesis and cell division. Several studies have hypothesized that using OCs negatively impacts folate status. This may be caused by malabsorption of folate polyglutamate, increased excretion of folates in the urine, and a quicker metabolism of folates through the induction of microsomal enzymes that require folic acid. The RDA for folate for adults is 400 μg/day of dietary folate equivalents (DFE), and RDAs vary depending on age and pregnancy. Good sources of folate include fortified cereals, green leafy vegetables, dark green vegetables (i.e., broccoli and Brussel sprouts), beans, and other legumes.

Riboflavin, another water-soluble B vitamin, is involved in metabolic processes, energy production, and normal cell function and growth. Studies have demonstrated the association between consumption of OCs and a higher prevalence of riboflavin deficiency due to the body's inability to absorb the vitamin. It has also been shown that riboflavin supplementation decreases headache frequency, intensity, duration, and medication intake in patients with migraine disorder. Given that headaches are a common side effect reported by patients taking
OCs, supplementation could be beneficial. The RDA for riboflavin for women is 1.1 mg per day. Good sources of riboflavin include eggs, dairy products, meats, green vegetables, and grains.

Vitamin B6, a water-soluble vitamin that includes six compounds, participates as coenzymes in various processes of the body that involve protein metabolism, carbohydrates, and lipid metabolisms. It also assists with the biosynthesis of neurotransmitters (e.g., conversion of tryptophan to niacin and serotonin). A recent large study found that plasma pyridoxal 5’ phosphate (PLP) concentrations were significantly reduced in 75% of women taking OCs who did not use dietary supplements. The RDA for B6 for women between 19-50 years is 1.3 mg per day and 1.5 mg per day for those over 50 years of age. Good food sources of B6 include meat, fish, nuts, beans, grains, fruits, and vegetables.

Vitamin B12 is also essential in cell metabolism and is vital to DNA synthesis and regulation, fatty acid synthesis, and energy production. Several studies have found low vitamin B12 serum levels in women using OCs compared to non-users. The exact mechanism by which serum vitamin B12 is reduced in OC users is unclear and not fully understood. A potential explanation could be that OC affects the binding capacity and the levels of transcobalamin I (a glycoprotein that protects B12 from acid degradation in the stomach) of vitamin B12 in women taking OCs. The RDA for B12 for adults is 2.4 mcg per day. Good food sources include fish, meat, poultry, and dairy products.

Another vitamin that may be depleted by OCs is vitamin C. It is a cofactor in various metabolic processes, including collagen synthesis, carnitine, catecholamine, peptide amination, and tyrosine. Vitamin C also acts as an antioxidant and maintains metal ions in reduced forms (e.g., iron and copper). Researchers determined the effect of OCs on vitamin C status through
the amount of ascorbate in plasma leukocytes, platelets, and whole blood entities. Studies show that vitamin C levels are lowered in platelets and leukocytes with the use of OCs, which is thought to increase the rate of vitamin C metabolism. Another study found significant increases in malondialdehyde levels which is associated with decreased activities of glutathione peroxidase (GPx) and glutathione reductase (GR) in women taking low-dose OCs when compared to the control group. The latter indicated increased oxidative stress created by hormonal therapy. Supplementation of vitamin C and E significantly increased GPx and GR activity and reduced plasma malondialdehyde levels in women taking a low dose of OCs. The RDA for vitamin C for women is 75 mg per day. Good food sources include citrus fruits, berries, tomatoes, potatoes, and green leafy vegetables. Vitamin E, a potent antioxidant that protects tissues from oxidative stress and free radicals, is decreased in women taking OCs. Studies have found increases in the clotting activity of platelets and a decrease in plasma vitamin E in OCs users suggesting an increased risk of cardiovascular disease. The RDA for vitamin E for adults is 15 mg per day. Good sources include nuts, seeds, and vegetable oils.

OCs are known to deplete vitamins, as mentioned above, and a few minerals. Zinc, for instance, has roles in RNA and DNA metabolism, signals transduction and gene expression, and regulates apoptosis. The zinc status of women using OCs is lower than those who don’t take OCs. The decrease in serum zinc could be attributed to the reduction of zinc absorption, excretion, or tissue turnover that can result in zinc deficiencies. The latter causes women on OCs to have a higher dietary zinc requirement than women who do not. The RDA for zinc for women is 8 mg per day but varies depending on gender and pregnancy. Good food sources include oysters, red meat, poultry, whole grains, and milk products.
Another mineral that may be impacted by the pill is selenium, a micronutrient that functions as a cofactor to reduce antioxidant enzymes, such as GPx and thioredoxin reductase.\textsuperscript{22} This mineral also plays a role as a cofactor in the functioning of the thyroid gland and every cell that requires thyroid hormones.\textsuperscript{22} Several studies indicate that the consumption of OCs interferes with selenium absorption, which can result in deficiency and increase the risk of developing other comorbidities.\textsuperscript{22,52} The RDA for selenium for adults is 55 mcg per day (pregnancy has higher requirements). Good food sources include cereals, meat, dairy products, fish, seafood, and nuts.\textsuperscript{54} Magnesium is another essential mineral in the body that may be depleted by OCs.\textsuperscript{22,55-58} Magnesium must be bound to ATP to be biologically active; over 300 enzymes require the presence of magnesium ions for their catalytic action.\textsuperscript{22,49} Inadequate intake or absorption can lead to a deficiency, increasing the risk of chronic diseases and altering the calcium/magnesium ratio affecting blood coagulability.\textsuperscript{22,49} The RDA for magnesium for women is 310-320 mg per day. Good food sources include green leafy vegetables (i.e., spinach), legumes, nuts, seeds, and whole grains.\textsuperscript{59}

**General Recommendations**

Women taking OCs may have to consider supplementing depleted vitamins, minerals, and antioxidants regardless of whether they decide to stay on the pill or get off it for better health outcomes.\textsuperscript{2,4,22,23} The possibility of preventing vitamin and mineral deficiencies through the intake of appropriate dietary supplements should be considered as a first-line approach by clinicians.\textsuperscript{22} Supplementation will depend on each individual; therefore, it is essential to work with a health care professional. Although many of these micronutrients can be found in everyday foods, it is known that vitamins and minerals are not readily bioavailable compared to supplements.\textsuperscript{22} This often can be caused due to cooking, storage, and processing, which often
results in reduced or lost nutrients. Supplementing these vitamins and minerals can help replenish the lost nutrients while on OCs; however, other practices may be necessary to re-balance hormones. Women should also address diet, stress management, exercise, sleep, supporting gut health, adrenal glands, and the liver.

It is recommended that women on and off the pill consume adequate amounts of quality protein and fats to help with the production of hormones. It is also recommended to consume a sufficient amount of fiber to have appropriate motility and elimination of waste products and toxins. Seed cycling, for example, can influence hormones throughout the follicular and luteal phases of the menstrual cycle. Although there is a lack of evidence, many doctors recommend it. However, this topic grants further investigation. Seed cycling consists of rotating seeds into the diet; the first half of the cycle (days 1-14) should include seeds supportive of estrogens, such as flax, hemp, and pumpkin, ingested daily. The latter contains lignans which can bind to excess estrogen in the body allowing for more efficient elimination. The second half of the cycle (days 15-30) involves seeds that support progesterone, such as sunflower and sesame seeds.

Conclusion

In summary, the birth control pill is associated with nutrient depletion, and many women are using the birth control pill as a contraceptive method, especially women aged 18-25. However, most women in the age group are in college. Therefore, this capstone project is intended to provide women in college an overview of how a regular menstrual cycle works, the potential nutritional implications while on the birth control pill, a guide on what to do nutritionally while on the pill, and general recommendations. This information will be exhibited
through a booklet divided into four sections, and its purpose is to create awareness and educate women to make informed decisions.
EAT FOR YOUR HORMONES
HORMONES
HORMONES
HORMONES
HORMONES

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Part I. The funny business of the Pill

- 65% of women in the US aged 15-49 use contraception
- 14% accounted for oral contraception (the pill), the most common method
- 37% of women aged 18 to 25 have used oral contraception.
- Although the pill has helped women decide whether to have a child and work outside the home, it has many side effects.

Potential Side Effects:

- Hormonal imbalance (i.e., missing or irregular cycles, light or heavy periods, infertility)
- Digestive issues (i.e., leaky gut, gut dysbiosis, inflammatory bowel disease)
- Energy disruption (i.e., fatigue, adrenal and thyroid dysfunction)
- Mood dysregulation (i.e., depression, anxiety)
- Vitamin, mineral, and antioxidant depletion
- Skin problems (i.e., hair loss, dry skin)
- Disturbance to lady parts (i.e., low libido, vaginal dryness, chronic infection, pain with sex)
- Increases the risk of blood clots, which could lead to strokes
- Increases the risk of breast, cervical, and liver cancers

Main organs involved in a cycle:

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Part II. A Woman's Cycle

Hormones in a Cycle:
Hormones influence energy levels, mood, and behavior depending on their appearance in the cycle.

The main Characters:

The Boss

Gonadotrophin-releasing hormone (GnRH), the boss of our cycles, is released by a gland in the head called the hypothalamus. The signals are picked by a neighboring gland called the pituitary, and this gland releases two other hormones which cause ovulation.

The Cheerleader

Follicular Stimulating Hormone (FSH), the contestant's praiser, stimulates the follicles in the ovaries to grow and mature to release an egg at ovulation. In the beginning, it stimulates the follicles until one outshines the other, where it stands down. Later in the cycle, just before ovulation, FSH arrives with another hormone called luteinizing hormone (LH), and ovulation occurs once they peak.

The Flirty and Energetic

Estrogen is the hormone that dominates the first half of the cycle (follicular phase). It is secreted by the follicular cells and causes the uterus to plump up in case a fertilized egg is implanted in the second half of the cycle (luteal phase). Estrogen can make us feel confident, sensual, and on top of the world.

The Performer

Luteinizing hormone (LH) appears right before ovulation as estrogen peaks. LH delivers the power stroke necessary for ovulation and lays the foundation for progesterone production in the second half of the cycle. Although it may seem like estrogen is the star of the show, LH has the power to make ovulation happen.

The Athlete

Testosterone is not a man's hormone, given that every human produces it; it peaks around ovulation as estrogen and LH peak. It appears right before ovulation as estrogen reaches its peak. An active, sexy, sassy, ambitious, and competitive hormone. In addition, it strengthens our bones and contributes to an increased sexual desire around ovulation.

The Introvert

Progesterone is produced due to ovulation, dominating the second half of the cycle (luteal phase). It develops and maintains the uterus lining to host a fertilized egg (if there is one). It is essential for conceiving and sustaining a pregnancy. Other roles include bone health, breast, and uterine cancer prevention, and aid in mood and sleep. Progesterone can make us calm and not keen on socializing or meeting new people.
What is considered a normal cycle?

- Menstruating involves a rhythm of hormones falling and rising throughout the days of a cycle.
- A typical menstrual cycle can last 28 days in 10-15% of women.
- The cycle can also range from 26 to 36 days depending on each individual woman.
- Although there may be longer and shorter cycles as long as they’re regular it is considered normal.
- **GOAL:** to release an egg and pass along genes for the next generation.

![Diagram of menstrual cycle phases]

### A. Bleeding:
- The first day of the cycle
  - Occurs when estrogen and progesterone drop, triggering the lining of the uterus to shed.
  - Typical bleeding occurs from day 1 to approximately day 7.
  - The drop in estrogen and progesterone stimulates the hypothalamus (a gland located in the brain) to release **GnRH**.
- **GnRH** stimulates the pituitary gland which releases **FSH**.

### C. Luteal Phase:
- The ruptured follicle becomes the corpus luteum, producing **progesterone**.
  - Progesterone is the most dominant hormone in the luteal phase or second half of a cycle (Days 15-28).
  - **Progesterone** peaks around Day 21.
  - If the egg is not fertilized by sperm, all hormones drop, and the menstrual cycle starts again.

### B. Follicular Phase:
- **FSH** stimulates the growth of the follicles in the ovaries to get an egg ready for ovulation.
  - **Estrogen** starts to rise around Day 8, causing slight changes in the body (i.e., fuller lips, more curves, and energy).
  - Around days 9-10, **testosterone** increases, elevating libido before ovulation.
  - Around days 12-14, **estrogen** reaches its peak to release **LH**, which stimulates the ovaries to release a mature egg.
  - Once the egg ruptures the follicle, it travels down the fallopian tubes and implants in the uterus if fertilized by sperm or slowly dissolves and passes out of the body with menstruation.

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A Cycle On Oral Contraceptives

- Most birth control pills deliver a hefty dose of synthetic estrogen and progesterone throughout the month except for a week when a placebo/sugar pill is given.
- The increased daily dose of synthetic hormones suppresses the pituitary from releasing FSH and LH, preventing follicular growth and ovulation.
- The brain then notices enough hormones circulating and diminishes GnRH signaling to produce more.

- Oral contraceptives act like a great wall between the brain, the pituitary, and the ovaries, preventing natural rhythm and communication.
- The lack of communication significantly affects hormonal balance.

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Part III: Potential Nutritional Implications

The pill may deplete the following nutrients and may cause:

<table>
<thead>
<tr>
<th>Folate (Vit B9)</th>
<th>Ascorbic acid (Vit C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riboflavin (Vit B2)</td>
<td>Tocopherol (Vit E)</td>
</tr>
<tr>
<td>Pyridoxine (Vit B6)</td>
<td>Magnesium</td>
</tr>
<tr>
<td>Cobalamin (Vit B12)</td>
<td>Selenium</td>
</tr>
<tr>
<td>Fluid retention</td>
<td>Zinc</td>
</tr>
</tbody>
</table>

Part IV: General Recommendations

1. Supplement depleted nutrients *
2. Eat foods rich in depleted vitamins and minerals
3. Eat enough protein and fat for adequate hormone production
4. Drink plenty of water and eat fiber to help digestion and detox pathways
5. Incorporate seed cycling **
6. Get proper sleep & reduce stress

*Always speak to your health practitioner before starting a supplement
**Although there is a lack of evidence, many health care providers recommend it

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## Food Sources High in Nutrients Potentially Depleted by the Pill

### Folate
- Green leafy vegetables (i.e., collard greens, spinach)
- Green vegetables (i.e., broccoli, asparagus)
- Beans (i.e., black & pinto beans)
- Lentils
- Other legumes
- Liver

### Vitamin C
- Citrus fruits (i.e., lemon, orange)
- Berries (i.e., strawberry)
- Green vegetables (i.e., broccoli, Brussel sprouts)
- Tomato
- Potato
- Kiwi

### Riboflavin (B2)
- Eggs
- Milk/dairy
- Meat (i.e., liver)
- Legumes
- Grains (i.e., oats, rice)
- Green vegetables (i.e., asparagus)

### Pyridoxine (B6)
- Fruits
- Vegetables
- Meat (i.e., liver)
- Fish
- Nuts
- Beans
- Grains

### Vitamin B12
- Fish
- Meat
- Poultry
- Dairy

### Vitamin E
- Nuts (i.e., almonds, walnuts)
- Seeds (i.e., sunflower)
- Plant oils

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Magnesium
- Green leafy vegetables
- Legumes
- Nuts
- Seeds
- Whole grains

Selenium
- Meat
- Dairy
- Fish
- Seafood
- Grains
- Nuts
  (i.e., Brazil nuts)

Zinc
- Oysters
- Red meat
- Poultry
- Dairy
- Whole grains

Additional Considerations

Protein*
- Eggs
- Beef
- Chicken
- Fish
- Soy products
  (i.e., tempeh, tofu)
- Legumes combined with grains and vegetables to make them complete

Fat
- Avocado
- Olives
- Nuts
- Ghee
- Avocado, coconut, and olive oils

Fiber**
- Vegetables
- Fruit
- Grains
- Plant derived foods

Hydration
- Mainly water if possible
  (i.e., infused, plain)
- Herbal tea

*Grass-fed or pasture-raised whenever possible
** Organic, locally grown, and/or in season whenever possible

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Seed Cycling

Luteal Phase

Day 1

Follicular Phase

Day 15

Sesame
Sunflower
Hemp 1-2 Tbs each/day

Pumpkin
Freshly ground flax
Hemp 1-2 Tbs each/day

Seed Cycling

Building a Harmonious Plate

B. Fat (i.e., avocado, olives, nuts)

E. Hydrate

A. Protein (i.e., eggs, tofu, fish)

C. Non-starchy veggies (i.e., leafy greens, cruciferous)

D. Starchy Vegetables, grains, and beans (i.e., corn, rice, lentils)

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<table>
<thead>
<tr>
<th>Method</th>
<th>Hormonal</th>
<th>What is it?</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implant</td>
<td>Yes</td>
<td>Small rod with progestin injected under the skin of the arm.</td>
<td>With correct use &gt; 99% (lasts for 3 years)</td>
</tr>
<tr>
<td>IUD with Progestin</td>
<td>Yes</td>
<td>Intrauterine device containing progestin</td>
<td>With correct use &gt; 99% (lasts for 6 years)</td>
</tr>
<tr>
<td>Injectable</td>
<td>Yes</td>
<td>Injected deep into a muscle, such as in the buttock or upper arm</td>
<td>With correct use &gt; 99% (lasts for 3 months)</td>
</tr>
<tr>
<td>Birth Control Pill</td>
<td>Yes</td>
<td>A daily pill that delivers synthetic hormones each month</td>
<td>With correct use 99%; with typical use 91%</td>
</tr>
<tr>
<td>Vaginal Ring</td>
<td>Yes</td>
<td>Flexible plastic ring inserted into the vagina; contains estrogen and progestin</td>
<td>With correct use 99%; (lasts for 1 month)</td>
</tr>
<tr>
<td>Skin Patch</td>
<td>Yes</td>
<td>Contain estrogen and progestin. Placed on the shoulder, upper back, abdomen, or buttock</td>
<td>With correct use 99%; with typical use 91%</td>
</tr>
<tr>
<td>Copper IUD</td>
<td>No</td>
<td>Intrauterine device containing copper</td>
<td>With correct use 99% (lasts 7-10 years)</td>
</tr>
<tr>
<td>Condom</td>
<td>No</td>
<td>Thin barrier of latex, lamb-skin, or synthetic fibers placed over an erect penis</td>
<td>With correct use 98%; with typical use 85%</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>No</td>
<td>Dome shaped device made of flexible silicone that fits over the cervix</td>
<td>With correct use 94%; with typical use 88%</td>
</tr>
<tr>
<td>Sponge</td>
<td>No</td>
<td>A foam disc containing spermicide that covers the cervix</td>
<td>If never given birth 88%; After giving birth 76%</td>
</tr>
</tbody>
</table>
| Cervical Caps     | No       | Silicone cup covering the cervix. It needs to be used with spermicide | With typical use 71-86%; less effective after birth     

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Other Alternative Methods

<table>
<thead>
<tr>
<th>Fertility Awareness Method (FAM)</th>
<th>Withdrawal Method</th>
<th>Tubal Ligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A non-hormonal approach based on recognizing the signs of ovulation</td>
<td>• A non-hormonal approach which requires partner withdraw his penis before ejaculation</td>
<td>• A surgical procedure in which the fallopian tubes are tied or blocked; it is irreversible.</td>
</tr>
<tr>
<td>• <strong>Effectiveness:</strong> With correct use 95-99%; with typical use 80%</td>
<td>• <strong>Effectiveness:</strong> With correct use 96%; with typical use 80%</td>
<td>• <strong>Effectiveness:</strong> More than 99%.</td>
</tr>
</tbody>
</table>

What to do with this information?

Here is the following checklist:

- Consider all the contraceptive choices, do your research, and speak with your physician
- List of cons and pros
- Check your blood levels
- Meet with a dietitian
- Self-assess foods you are consuming
- Start tracking symptoms, mood, energy, and thoughts throughout your cycle
Remember

Knowledge is power, and now you know the basics of how a typical cycle and a cycle under the influence of birth control work. Regardless of your decision, please take this information and apply it with the help of your healthcare team.

The information in this guide about your health or wellness or any other aspect of your life is not intended to substitute for the professional medical advice, diagnosis, or treatment provided by your own Medical Provider or Mental Health Provider. The guidance included is not designed to reverse or treat any medical conditions. You agree and acknowledge that I am not providing medical, mental health, or religious advice in any way. Always seek the advice of your own Medical Provider and Mental Health Provider regarding any questions or concerns about your specific health or any medications, herbs, or supplements you are currently taking before implementing any recommendations or suggestions in this guide. Do not disregard medical advice or delay seeking medical advice because of the information you have read here. Do not start or stop taking any medications without speaking to your own Medical Provider or Mental Health Provider. If you have or suspect a medical or mental health problem, contact your own Medical Provider or Mental Health Provider promptly. The Food and Drug Administration has not evaluated the information contained in this guide.
References


REFERENCES


