



ESTROGEN FACTORS™

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WOMEN & REPRODUCTION

A woman's reproductive cycle is an amazing series of events that are the result of an intricate combination of physical and chemical processes within the body. The events in this cycle are controlled and triggered by hormones for the sole purpose of preparing a woman's uterus to receive a fertilized egg. Estrogen is one of the hormones responsible for these cyclic changes.

ESTROGEN PRODUCTION

As a woman matures from puberty, her normal reproductive years are characterized by monthly rhythmic changes in the secretion rates of female hormones and the resulting physical changes in the ovaries and sexual organs.¹ This is marked by the first physical manifestations of the reproductive cycle known as the menarche.

The female hormonal system consists of a three level hierarchy of glands that are responsible for the production and secretion of these hormones. The first level of this hierarchy begins in the hypothalamus, where, through a complex portal system of capillaries, called the hypothalamic-hypophysial portal system, hormones are secreted to the anterior pituitary gland.²

In response, the anterior pituitary gland secretes what are known as the gonadotropic hormones. The ovarian and uterine changes that occur during the cycle are completely dependant upon these hormones secreted by the anterior pituitary gland.³ Thus, this system resembles a set of relays, carrying messages through several steps from the central nervous system to a specific effect or molecule in the target cells.⁴ There are two different gonadotropic hormones secreted by the anterior pituitary gland that are essential to the proper functioning of the ovaries and the over all homeostasis or balance of the entire system. These hormones are known as FSH (follicle stimulating hormone) and LH (luteinizing hormone). FSH and LH are necessary components in the production of estrogen and progesterone in the ovaries as well as the maintenance of homeostasis of a woman's reproductive cycle. The gonadotropic hormones are transported to the ovaries by the blood and are responsible for ovarian hormone production through what is called a cyclic AMP (adenosine monophosphate) mechanism. An AMP mechanism occurs when stimulating hormone combines with a receptor on the surface of the target cells.⁵ In this case the target cells are the

ovaries. The ovaries are the third level in the hierarchy of glands that regulate and control a woman's reproductive cycle.

Each ovary contains more than 200,000 primordial follicles.⁶ They do not develop until they have been stimulated by the FSH secreted by the anterior pituitary gland. In response to FSH these follicles develop and begin to secrete estrogen.⁷ After a week of growth, one follicle begins to outgrow the others. This is known as the vesicular follicle. In a process called atresia, this follicle continues to grow and secrete high amounts of estrogen while the other follicles involute, or shrink, which allows this one follicle to grow large enough to ovulate.⁸

In a non-pregnant female, estrogens are secreted by the ovaries in response to FSH stimulation. However, small amounts are also secreted by the adrenal cortices.⁹ Healthy adrenal glands may be one reason why some women feel less of the uncomfortable symptoms of menopause once their reproductive years have come to a close.

The various hormones described above are not secreted in constant, steady amounts, but instead are secreted at drastically differing rates during different parts of the cycle.¹⁰ Most often, negative feedback systems regulate the rates of hormonal secretions. Negative feedback is a mechanism of response in which a stimulus initiates actions that reverse or reduce that stimulus.¹¹ For example, estrogen acts on the hypothalamus to reduce secretion of releasing hormones and to inhibit the release of FSH from the pituitary gland. Negative feedback serves to modulate the level of circulating estrogen in a non-pregnant female.¹²

ABOUT ESTROGEN

The question now becomes, what exactly is estrogen and what role does it play in the physical manifestations of a woman's monthly reproductive cycle? What role does estrogen play in the maintenance of the homeostatic balance of a woman's entire body?

Estrogens are female sex hormones, produced by the ovaries, concerned with the development and maintenance of female reproductive structures and secondary sex characteristics.¹³ Estrogen is a steroid synthesized in the ovaries from cholesterol or acetyl coenzyme-A.¹⁴

One of the reproductive structures affected by the estrogens is the uterus. The endometrium

is a mucous membrane lining the inner surface of the uterus.¹⁵ Estrogen stimulates the growth and differentiation of cells in the endometrium causing it to increase greatly in size and thickness. The changes in the endometrium prepare the organ to receive and nourish an embryo and also stimulates the production of luteinizing hormone (LH) in the pituitary.¹⁶ LH triggers ovulation and production of a second ovarian hormone, progesterone, which continues preparing the endometrium for implantation of the egg. If the ovum released during ovulation is not fertilized the endometrial lining is shed.¹⁸ The physical manifestation of this is marked by a woman's period each month.

Another of the reproductive structures affected by estrogen are the fallopian tubes. Estrogen causes the glandular tissues and cilia that line the tubes to increase.¹⁹ Cilia are hair like structures that help to carry the ovum to the uterus. Estrogen considerably enhances the activity of the cilia which constantly and rhythmically beat towards the uterus.²⁰

Estrogen also initiates growth of the breasts by causing fat deposits, development of the stromal tissues, and the development of an extensive ductile system as well.²¹ Estrogen is also responsible for the outward appearance of the breast.

It is obvious that estrogen initiates the growth and physical changes of a woman's reproductive cycle. However, it is only responsible for the first part of the cycle. On the other hand, progesterone is concerned with the final preparations of the reproductive structures for pregnancy.²² Both hormones work hand in hand in maintaining the homeostasis and proper functioning of the reproductive organs.

ESTROGEN & HOMEOSTASIS

Homeostasis is defined as balance and harmony within the body. Homeostasis is achieved when (1) the body has the proper amounts of gases, nutrients, ions, and water; (2) maintains the optimal internal temperature and; (3) has an optimal volume for the health of the cells. When homeostasis is disturbed, health may be affected.²³

During a woman's reproductive years, a feedback system involving the hypothalamus and pituitary glands, as well as the ovaries, keeps production of the various hormones in balance.

Estrogen has profound effects on other

systems and functions of a woman's body that are not reproductive. For example, estrogen has a significant effect on a woman's skin. Estrogens cause the skin to develop a texture that is soft and usually smooth, almost like that of a child but thicker.²⁴

The skeletal system in a woman's body is also profoundly affected by the estrogens. Between puberty and mid-life, estrogens and other hormones maintain bone tissue by stimulating osteoblasts to form new bone. After menopause, women produce smaller amounts of estrogen as they age. As a result, the osteoblasts become less active and there is a decrease of bone mass.²⁵

As the reproductive years of a woman come to an end, the estrogen (and progesterone) levels in her body decrease rapidly almost to none. The period during which the cycles cease as a result of this loss of estrogen is called the menopause. Over the years there are fewer follicles in the ovaries to be stimulated by FSH which results in decreased estrogen production.²⁶ Not until estrogen levels become too low to stimulate endometrial growth does menstruation stop once and for all.

This loss of estrogen to a system that has been dependant on it since the onset of the menarche creates a homeostatic imbalance in the system that can have profound physiological ramifications. Hot flashes, irritability, night sweats, anxiety and depression are all caused by the loss of estrogens at the onset of menopause.²⁷ Women who are rendered incapable of reproduction as a result of removal of the reproductive organs also go through the physical symptoms of menopause. Estrogen plays a major role in maintaining the homeostasis of a woman's system.

NUTRITIONAL SUPPORT FOR ESTROGEN

The following information is provided to help you better understand the role that certain nutrients play in the function and production of estrogen.

VITAMIN C occurs in large concentrations in the adrenals and plays a role in the synthesis of steroids by the adrenals.²⁸ Estrogen is a steroid and is secreted in small amounts by the adrenals. It also plays a role in neurotransmitter synthesis and metabolism which also explains the vitamin C concentrations in the adrenal glands.²⁹

PANTOTHENIC ACID plays its primary role as a component of the coenzyme-A molecule.³⁰ This is important in the synthesis of compounds like sterols and steroid hormones.³¹ Estrogen is a steroid hormone synthesized in the ovaries from acetyl coenzyme-A.³²

VITAMIN A is essential for the integrity of epithelial tissue.³³ Vitamin A is necessary for the growth and proliferation of the epithelial cells.³⁴ Epithelial cells line the body cavities and principal tubes and passageways leading to the exterior.³⁵ Ciliated epithelial cells have hairlike structures on their free border and sweep particles in a certain direction.³⁶ As previously stated, estrogen causes the glandular epithelial cells and cilia that line the tubes to increase. These are cells that form the secreting portions of glands and their ducts.³⁷ Since estrogen causes an increase in these epithelial cells, vitamin A is necessary to maintain the integrity of these cells. Inadequate vitamin A supply can play a role in failure of reproduction.³⁸

ABOUT MICHAEL'S® PRODUCTS

Seasoned health food shoppers already know that a combination of nutrients is always more effective than taking single nutrients one at a time. Add in the cost savings of taking combinations, with herbs included, and the math proves to be more efficient, too. Combinations increase assimilation and reduce the amount of binders and fillers. That's why MICHAEL'S® created the FACTORS OF LIFE® programs. Your life is busy enough as it is. Why worry when synergistically complete nutrition is conveniently at hand?

MICHAEL'S® products include an expiration date to ensure freshness. He personally guarantees purity and specified content. Each product is hypo-allergenic with no artificial colors or flavors. The formulas contain cold-pressed or organically grown (when available) herbs to ensure the highest quality. Additionally there is no sugar, wheat, corn, gluten, sodium, or anything artificial in any of our supplements. These high-potency, all-natural products are even manufactured with food-grade fillers,


binders and enteric coatings. Most are suitable for vegetarians and tell you so right on the front label. Every product is double safety sealed with an outer shrink wrap and inner bottle freshness seal. As is normal in all-natural products, some color and texture variations may occur, but do not affect product purity, potency or assimilation.

Above all else, all MICHAEL'S® NATUROPATHIC PROGRAMS are designed to produce physical results you can feel, due to the innovative nutritional supplementation with specific, targeted FACTORS OF LIFE® programs. As always, the newest developments, the finest ingredients and the most effective formulations for your total healthcare from MICHAEL'S® NATUROPATHIC PROGRAMS.

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Estrogen Factors™

Supplement Facts	
Serving Size: One (1) Tablet	
Amount Per Serving	% Daily Value
Vitamin A (as Beta Carotene and 3% Alpha Carotene)	3,000 IU 60%
Vitamin C (as ESTER-C®)	100 mg 166%
Vitamin E (as d-alpha Tocopheryl Succinate)	50 IU 167%
Niacinamide (as Nicotinamide)	50 mg 250%
Vitamin B-6 (as Pyridoxine)	15 mg 750%
Pantothenic Acid (as D-Calcium Pantothenate)	100 mg 1000%
Selenium (as L-Selenomethionine)	25 mcg 36%
Phenylalanine (as L-Phenylalanine)	125 mg *
Mexican Wild Yam Root (Dioscorea villosa)	100 mg *
Tyrosine (as L-Tyrosine)	75 mg *
Suma Root (Pfaffia paniculata)	50 mg *
Dong Quai Root (Angelica sinensis)	50 mg *
Chaste Tree Berry (Vitex agnus castus)	50 mg *
Natural Mixed Carotenoids (from Betatene® 7.5%**)	25 mg *
β-Carotene	23.8 mg
α-Carotene	750 mcg
Cryptoxanthin	183 mcg
Zeaxanthin	150 mcg
Lutein	117 mcg
†Black Cohosh Root (Cimicifuga racemosa)	25 mg *

*Daily Value not established.

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CAUTION: Contains Phenylalanine and should be avoided by phenylketonurics and women who are pregnant or lactating.
 OTHER INGREDIENTS: Dicalcium Phosphate, Vegetable Stearate and Stearic Acid.