

Endocrinology of Lactation

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COMMENTARY

The endocrine control of lactation is one of the most complex physiologic mechanisms of human parturition. Mammogenesis, lactogenesis, galactopoiesis, and galactokinesis are all essential to assure proper lactation. Prolactin is the key hormone of lactation and seems to be the single most important galactopoietic hormone. Oxytocin, serotonin, opioids, histamine, substance P, and arginine-leucine modulate prolactin release by means of an autocrine/paracrine mechanism, whereas estrogen and progesterone hormones can act at the hypothalamic and adenohypophysial levels. Human placental lactogen and growth factors play an essential role to assure successful lactation during pregnancy. Oxytocin is the most powerful galactokinetic hormone.

The idea of health-promoting foods is not new: Hippocrates wrote 2400 years ago “Let food be thy medicine and medicine be thy food” and Asian communities were familiar with the concept of functionality of food products and herbs. Now-a-days, the advances in scientific research support the idea that diet may fulfill nutritional needs and exert a beneficial role in some diseases.

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The local effects of estrogen and progesterone in the breast prevent the secretion of milk during pregnancy. With their withdrawal during the postpartum period, the stimulating effect of the anterior pituitary hormone prolactin dominates and milk secretion is initiated as well as maintained.

Lactogenic hormone, gonadotropic hormone secreted by the anterior pituitary; in females it stimulates growth of the mammary glands and lactation after parturition. Therefore, after a brief summary on the definitions, regulatory framework, and market

size of functional foods, a review of the scientific advances on functional beverages is presented, with a focus on the main examples of commercially available products and potential health benefits due to their consumption. Lactation occurs with the help of two hormones, prolactin and oxytocin. Although prolactin and oxytocin act independently on different cellular receptors, their combined actions are essential for successful lactation. Prolactin is a polypeptide hormone synthesized by lactotrophic cells in the anterior pituitary. Thus, the interactive effects of the two female sex steroid hormones are not quite straightforward, so do the effects of reduction in both of them during lactation. Oxytocin is released in a pulsatile manner during suckling. It was demonstrated with positive effects on cognitive function, which supported that breastfeeding accompanied with oxytocin release may contribute to lower risk of cognitive impairment.

Lactogenesis, or the process of changes to the mammary glands to begin producing milk, begins during the late stages of pregnancy. The delivery of the placenta and the resulting dramatic reduction in progesterone, estrogen, and human placental lactogen levels stimulate milk production. Colostrum is the first milk a breastfed baby receives. It contains higher amounts of white blood cells and antibodies than mature milk and is especially high in immunoglobulin A. This immunoglobulin coats the lining of the baby's immature intestines, helping to prevent pathogens from invading the baby's system. Lactation describes the secretion of milk from the mammary glands and the period of time that a mother lactates to feed her young. The process occurs in all female mammals, although it predates the origin of mammals. Lactation is a defining aspect of mammalian reproduction that requires a mother to undergo demanding and fascinating physiological changes that support the survival and growth of her newborn. A mother's preparation for milk production begins as early as during her own fetal development, when epithelial tissue first develops within the breasts, and continues through puberty and adulthood, as the breast epithelium reaches sexual maturity.

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Received: June 14, 2021, **Accepted:** June 22, 2021, **Published:** June 30, 2021

Citation: Parson D (2021) Endocrinology of Lactation. J Adv Dairy. 10:566.

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