Roles of hormones in lactation :—

From the 24th week of pregnency (the 2nd and 3rd trimester) a womens body produces hormones that stimulate the growth of milk duct system in the breasts :—

[i] Progesterone influences the growth in size of alveoli and lobes., high levels of progesterone inhibit lactation before birth. Progesterone levels drop after birth; this triggers the onset of copious milk production.

[ii] Estrogen Stimulate the milk duct system to grow and differentiate. Like progesterone, high level of estrogen also inhibit lactation. Estrogen levels also drop at delivery and remain low for the 1st several month of breastfeeding. Breastfeeding mothers should avoid estrogen-based birth control methods, as a spike in estrogen level may reduce a mother's milk supply.

[iii] Prolactin Contributes to the increased growth and differentiation of the alveoli, and also influences differentiation of ductal structures. High levels of prolactin during pregnancy and breastfeeding also increase insulin resistance, increase growth factor levels (IGF-1) and modify lipid metabolism in preparation for breastfeeding. During lactation, prolactin is the main factor maintaining tight junction of the ductal epithelium and regulating milk production through osmotic balance.

[iii] Human Placental Lactogen (HPL) from the second month of pregnancy, the placenta release large amounts of HPL. This hormone is closely associated with prolactin and appears to be instrumental in breast, nipple and areola growth before birth.

[iv] Follicle Stimulating Hormone (FSH), Luteinizing Hormone (LH) and Human Chorionic Gonadotropin (HCG), through control of estrogen and progesterone

production, and also, by extension, prolactin and growth hormone production, are essential.

[v] Growth hormone (GH) is structurally very similar to prolactin and independently contributes to its galactopoiesis.

[vi] Adrenocorticotropic hormone (ACTH) and Glucocorticoids (Cortisol) have an important for lactation including function in several animal species, including humans. Glucocorticoids play a complex regulating role in the maintenance of tight junctions.

[vii] Thyroid-Stimulating hormone (TSH) and Thyrotropin releasing hormone (TRH) are very important galactopoietic hormones whose levels are naturally increased during pregnancy.

[viii] Oxytocin contracts the smooth muscle of the uterus during and after birth and during orgasms. After birth oxytocin contracts the smooth muscle layer of band like cells surrounding the alveoli to squeeze the newly produced milk into the duct system. Oxytocin is necessary for the milk ejection reflex, or let down, in response to suckling, to occur.

By the fifth or sixth month of pregnancy, the breast are ready to produce milk.