Prolactine: de literatuurlijst met info

Mijn plan om een simpele bijlage over het hormoon Prolactine te schrijven liep uit de hand in een wetenschappelijk 'konijnenhol', waar ik verdwaalde in, interessante zijsporen, onbekende gaten in mijn kennis en gewoon pure nieuwsgierigheid. Hier niet alleen de literatuurlijst met meteen korte inkijkjes in wat ik tegenkwam. Ik ben nog op zoek naar de orginele artikelen als ik alleen een abstract heb, dus mogelijk ga ik hier en daar nog aanpassen.

Al-Chalabi M, Bass AN, Alsalman I. Physiology, Prolactin. In: StatPearls. StatPearls Publishing, Treasure Island (FL); 2023. PMID: 29939606.	The anterior pituitary function to produce hormones can become impaired due to mass effect (i.e., craniopharyngiomas) or infections such as tuberculosis and histoplasmosis. Infiltrative disease processes like sarcoidosis and hemochromatosis are also hypoprolactinemic etiologies. Lastly, autoimmune conditions like SLE, antiphospholipid syndrome, rheumatoid arthritis, multiple sclerosis, systemic sclerosis, autoimmune thyroid disease, and celiac disease can also impact prolactin production.	Open access, full article
Asai-Sato M, Okamoto M, Endo M, Yoshida H, Murase M, Ikeda M, Sakakibara H, Takahashi T, Hirahara F. Hypoadiponectinemia in lean lactating women: Prolactin inhibits adiponectin secretion from human adipocytes. Endocr J. 2006 Aug;53(4):555-62. doi: 10.1507/endocrj.k06-026. Epub 2006 Jul 19. PMID: 16849835.	Adiponectin is an adipocyte-derived hormone involved in glucose, lipid and energy metabolism. A low plasma adiponectin concentration is associated with insulin resistance, obesity and atherosclerosis. In women, energy homeostasis is remarkably changed during gestation and lactation in order to supply sufficient nutrition for a fetus or newborn. In this study we aimed to elucidate the physiological impact of gestation and lactation on the plasma adiponectin levels and the influence of reproduction-related hormones on adiponectin secretion.	Abstract
Daimon M, Kamba A, Murakami H, Mizushiri S, Osonoi S, Yamaichi M, Matsuki K, Sato E, Tanabe J, Takayasu S, Matsuhashi Y, Yanagimachi M, Terui K, Kageyama K, Tokuda I, Takahashi I, Nakaji S. Association between serum prolactin levels and insulin resistance in non-diabetic men. PLoS One. 2017 Apr 6;12(4):e0175204. doi: 10.1371/journal.pone.0175204. PMID: 28384295; PMCID: PMC5383244.	In conclusion, associations between serum PRL levels within the physiological range and HOMA-R (insulin resistance) were found to be positive for men. These findings indicate that higher serum PRL levels within the physiological range seem to be associated with insulin resistance in men in this non-diabetic Japanese population. Further studies are required to determine whether such findings are applicable to other ethnicities and whether the associations can be exploited to predict the risk for the incidence of type 2 diabetes mellitus.… *Opvallend want andere studies geven juist aan dat prolactine diabetes remt. Zie Asai-Sato et al*	Open access

Erickson EN, Carter CS, Emeis CL. Oxytocin, Vasopressin and Prolactin in New Breastfeeding Mothers: Relationship to Clinical Characteristics and Infant Weight Loss. J Hum Lact. 2020 Feb;36(1):136-145. doi: 10.1177/0890334419838225. Epub 2019 Apr 29. PMID: 31033381; PMCID: PMC9766886.	Benoemt juist oxytocine als factor bij melkproductie Maternal milk production requires the neuropeptide oxytocin. Individual variation in oxytocin function is a compelling target for understanding low milk production, a leading cause of breastfeeding attrition. Complicating the understanding of oxytocin pathways is that vasopressin may interact with oxytocin receptors, yet little is known about the role of vasopressin in lactation. … Oxytocin is an important trigger for prolactin (PRL) secretion from the anterior pituitary 2012). … Some researchers have noted that synthetic OXT use during labor results in different patterns of PRL release during and after labor compared to those laboring without synthetic OXT, (Bremme & Eneroth, 1980; Haning et al., 1978; Jonas et al., 2009; Onur, Erçal, & Karslioglu, 1989; Rae, Hollebone, Chetty, Clausen, & McFarlane, 2007) …	Volledig; ik ga verder lezen over synt.oxy en prolactine
Teodora Georgescu, Zin Khant Aung, David R. Grattan, Rosemary S. E. Brown; Prolactin-mediated restraint of maternal aggression in lactation ; Edited by Donald Pfaff, Laboratory of Neurobiology and Behavior, The Rockefeller University, New York, NY; received September 15, 2021; accepted December 27, 2021, February 7, 2022 119 (6) e2116972119 https://doi.org/10.1073/pnas.2116972119	One of the most dramatic switches in a mother's behavior is the lactation-specific display of aggression. This "maternal aggression" is a critical survival mechanism, enabling a mother to respond to and protect her young from dangers or perceived threats. While important, these defense activities must also be balanced with the need for the mother to prioritize offspring-directed behavior to nurture the offspring. Abnormal levels of maternal aggression have been linked to expression of postpartum anxiety and the display of hypervigilant parenting (1, 2). … In humans, increased feelings of anger, including that directed toward other family members or health care providers, is higher in mothers with postpartum depression (2). This highlights the importance for fine-tuned regulation of maternal aggression during lactation, in order to support healthy and appropriate interactions of the mother with both the infant and with other individuals…. …	Open access

	Although we initially hypothesized that prolactin might induce maternal aggression, our data have revealed a role for this hormone in restraining aggressive behavior. It is becoming increasingly apparent that in addition to the requirement for factors to induce aggressive behavior, unchecked or abnormally high levels of maternal aggression are also detrimental for both mother and offspring (1, 2). The presence of a hormonal cue to restrain the investment of energy and time into excessive defensive or aggressive behaviors may be adaptive to ensure sufficient maternal investment into offspring-directed behaviors.	
Georgescu T, Swart JM, Grattan DR, Brown RSE. The Prolactin Family of Hormones as Regulators of Maternal Mood and Behavior. Front Glob Womens Health. 2021 Dec 1;2:767467. doi: 10.3389/fgwh.2021.767467. PMID: 34927138; PMCID: PMC8673487.	Transition into motherhood involves profound physiological and behavioral adaptations that ensure the healthy development of offspring while maintaining maternal health. Dynamic fluctuations in key hormones during pregnancy and lactation induce these maternal adaptations by acting on neural circuits in the brain. Amongst these hormonal changes, lactogenic hormones (e.g., prolactin and its pregnancy-specific homolog, placental lactogen) are important regulators of these processes, and their receptors are located in key brain regions controlling emotional behaviors and maternal responses. … Maternal mental health problems during pregnancy and the postpartum period represent a major barrier in developing healthy mother-infant interactions which are crucial for the child's development. In this review, we will examine the role lactogenic hormones play in driving a range of specific maternal behaviors, including motivation, protectiveness, and mother-pup interactions.	Volledig artikel
Gettler, L.T., McDade, T.W., Feranil, A.B. and Kuzawa, C.W. (2012), Prolactin, fatherhood, and reproductive behavior in human males. Am. J. Phys. Anthropol., 148: 362-370. https://doi.org/10.1002/ajpa.22058	Among nonfathers, men with greater prolactin reported more lifetime sexual partners (P = 0.050) as well as more sexual activity in the month before sampling (P = 0.060). Our results suggest that fathers in Cebu have higher prolactin than nonfathers, with hormone levels highest among fathers of young infants. Although these findings are generally consistent with evidence from other species for pronurturing effects of prolactin, evidence for positive relationships between the hormone and measures of sexual behavior at Cebu point to likely complexities in the hormone's involvement in male reproductive strategy.	abstract

Grattan DR, Pi XJ, Andrews ZB, Augustine RA, Kokay IC, Summerfield MR, Todd B, Bunn SJ. Prolactin receptors in the brain during pregnancy and lactation: implications for behavior. Horm Behav. 2001 Sep;40(2):115-24. doi: 10.1006/hbeh.2001.1698. PMID: 11534971.	Numerous studies have documented prolactin regulation of a variety of brain functions, including maternal behavior, regulation of oxytocin neurons, regulation of feeding and appetite, suppression of ACTH secretion in response to stress, and suppression of fertility.	
Gust, K., Caccese, C., Larosa, A. *et al.* Neuroendocrine Effects of Lactation and Hormone-Gene-Environment Interactions. *Mol Neurobiol* **57**, 2074–2084 (2020). https://doi.org/10.1007/s12035-019-01855-8	While correlational studies suggest that lactation may confer a certain level of protection from mental illness, this benefit is not uniformly expressed in all women who choose to breastfeed. … In sum, neuroendocrine alterations induced by lactation may play a key role in determining reproductive psychiatric risk in a subset of hormone-sensitive women. Using these neuroendocrine factors as an individualized index of risk can help in devising targeted programs to support these women in pursuing lactation or, for those not able or willing, accessing psychological interventions in a timely manner.	Abstract, volledig artikel opgevraagd
Hartmann, P. E., & Boss, M. (2018). 4 How Breastfeeding Works: Anatomy and Physiology of Human Lactation. In *Breastfeeding and Breast Milk – from Biochemistry to Impact, (Ed, Family Larson- Rosenquist Foundation) Georg Thieme Verlag KG*. The Global Health Network. https://doi.org/10.21428/3d48c34a.b5eb7994	Goed overzicht en duidelijke grafieken over prolactinespiegels.	Open access
Basil Ho Yuen, Prolactin in human milk: The influence of nursing and the duration of postpartum lactation, American Journal of Obstetrics and Gynecology, Volume 158, Issue 3, Part 1, 1988, Pages 583-586, ISSN 0002-9378, https://doi.org/10.1016/0002-9378(88)90032-4.	Prolactin content was highest at 43.1 ± 4 ng/ml (± SEM) in the early transition milk immediately after the colostrum phase during the first postpartum week, decreasing to 11.0 ± 1.4 ng/ml in the mature milk ($p <$ 0.01) when weaning occurred in those mothers who breastfed for up to 40 weeks post partum. During suckling, the foremilk contained significantly more prolactin as compared with the hindmilk (29.5 ± 2.7 versus 21.0 ± 3.2 ng/ml; $p < 0.01$). These findings, taken together with the known biologic potency of prolactin in breast milk, the osmoregulatory influence of the hormona in mammary and intestinal function, and its absorption by the newborn experimental animal, suggest that the presence of prolactin in milk may play some role in both lactation and the intestinal absorptive function of the suckling newborn.	Abstract
Huang SK, Chih MH. Increased Breastfeeding Frequency Enhances Milk Production and Infant Weight Gain: Correlation with the Basal Maternal Prolactin Level. Breastfeed Med. 2020 Oct;15(10):639-645. doi: 10.1089/bfm.2020.0024. Epub 2020 Aug 14. PMID: 32799538.	>10 x voeden = hogere prl , hogere groei The mothers of Group II (> 10 x voeden / 24 u) had significantly higher basal serum PRL levels (116.4 ± 11.8 ng/mL versus 72.7 ± 7.77 ng/mL), but a	Abstract

	significantly lower increase in PRL postsuckling (168.5% ± 23.1% versus 291.6% ± 37.6% of basal PRL). The frequency of suckling was positively correlated (*r* = 0.5) with the basal PRL level.	
Javier Labad, et al; Stress biomarkers as predictors of transition to psychosis in at-risk mental states: Roles for cortisol, prolactin and albumin, Journal of Psychiatric Research, Volume 60, 2015, Pages 163-169, ISSN 0022-3956, https://doi.org/10.1016/j.jpsychires.2014.10.011. (https://www.sciencedirect.com/science/article/pii/S0022395614003094):	Verhoogde prolactinespiegel is bij niet-zwangere lacterende populatie met risico op psychische stress gerelateerd aan een grotere kans op psychose. Prolactinespiegel rijst bij psychosociale stress Prolactin, an anterior pituitary hormone that increases in response to psychosocial stress (Sobrinho, 2003, Lennartsson and Jonsdottir, 2011), … whether increased prolactin in ARMS subjects may contribute to the risk of developing a psychotic disorder	
Kruger TH, Leeners B, Naegeli E, Schmidlin S, Schedlowski M, Hartmann U, Egli M. Prolactin secretory rhythm in women: immediate and long-term alterations after sexual contact. Hum Reprod. 2012 Apr;27(4):1139-43. doi: 10.1093/humrep/des003. Epub 2012 Feb 14. PMID: 22333984.	**Results:** Compared with control condition, sexual intercourse with orgasm induced not only the well-established immediate PRL increase of ~300% but also an additional PRL elevation around noon of the next day (P< 0.05). These fluctuations were measured on top of the regular circadian rhythm of PRL, manifested as a surge early in the morning	A, volledig komt nog
C.M. Larsen, D.R. Grattan, Prolactin, neurogenesis, and maternal behaviors, Brain, Behavior, and Immunity, Volume 26, Issue 2, 2012, Pages 201-209, ISSN 0889-1591, https://doi.org/10.1016/j.bbi.2011.07.233. (https://www.sciencedirect.com/science/article/pii/S0889159111004727)	Dierstudie Evidence from our laboratory has shown that low prolactin in early pregnancy, and the consequent suppression of neurogenesis in the SVZ in the adult brain, is associated with increased postpartum anxiety and markedly impaired maternal behavior. Daughters of low prolactin mothers also display increased anxiety and a significant delay in the onset of puberty, which is associated with epigenetic changes in neuronal development (see Fig. 1). This suggests that, in rodents, low prolactin in early pregnancy exerts long-term effects that influence maternal mood postpartum, and offspring development. This mini-review aims to summarize the evidence showing that the prolactin-induced increase in SVZ neurogenesis during pregnancy underlies normal postpartum maternal interactions with pups.	A: volledig komt nog
Lopez-Vicchi F, De Winne C, Brie B, Sorianello E, Ladyman SR, Becu-Villalobos D. Metabolic functions of prolactin: Physiological and pathological aspects. J Neuroendocrinol. 2020 Nov;32(11):e12888. doi: 10.1111/jne.12888. Epub 2020 Jul 24. PMID: 33463813.	Prolactin has been hypothesised to play a key role in driving many of the adaptations of the maternal body to allow the mother to meet the physiological demands of both pregnancy and lactation, including the high energetic demands of the growing foetus followed by milk production to support the offspring after birth. Prolactin receptors are found in many tissues involved in metabolism and food intake, such as the pancreas, liver, hypothalamus, small intestine and adipose tissue. …	Abstract

	Overall, although prolactin may not play a major role in regulating metabolism and body weight outside of pregnancy and lactation, it definitely has the ability to contribute to metabolic function.	
Ivan Luzardo-Ocampo, José L. Dena-Beltrán, Xarubet Ruiz-Herrera, Ana Luisa Ocampo-Ruiz, Gonzalo Martínez de la Escalera, Carmen Clapp, Yazmín Macotela, Obesity-derived alterations in the lactating mammary gland: Focus on prolactin, Molecular and Cellular Endocrinology, Volume 559, 2023, 111810, ISSN 0303-7207, https://doi.org/10.1016/j.mce.2022.111810.	Women with overweight and obesity can develop mammary gland alterations that unable exclusive breastfeeding. Obesity associates with a disturbed lactating mammary gland endocrine environment including a decreased action of the hormone prolactin (PRL), the master regulator of lactation…. Also, treatment with PRL improves milk yield in women with lactation insufficiency. This review focuses on the impact of diet-induced obesity in the lactating mammary gland and how obesity impairs the lactogenic action of PRL. Although obesity alters lactation performance in humans and rodents, the responsible mechanisms have been mainly addressed in rodents.	Abstract, artikel aangevraagd
Macotela Y, Ruiz-Herrera X, Vázquez-Carrillo DI, Ramírez-Hernandez G, Martínez de la Escalera G, Clapp C. The beneficial metabolic actions of prolactin. Front Endocrinol (Lausanne). 2022 Sep 23;13:1001703. doi: 10.3389/fendo.2022.1001703. PMID: 36213259; PMCID: PMC9539817.	Prolactine bevordert gezond metabolisme bij gemiddelde waardes. Zou gezondheidseffect langere termijn kunnen verklaren bij bv. In contrast with the negative outcomes associated with very high (>100 µg/L) and very low (<7 µg/L) PRL levels, moderately high PRL levels, both within but also above the classically considered physiological range are beneficial for metabolism and have been defined as HomeoFIT-PRL.	Abstract
Maria Musumeci, Jacques Simporè, Alfonsina D'Agata, Lucia Malaguarnera, Cinzia Carrozza, Cecelia Zuppi, Salvatore Musumeci, Biologic substances present in human colostrums demonstrate the evolution of this essential nutrient for growth and development: Insulin-like growth factor-I and prolactin, Nutrition Research,Volume 25, Issue 2, 2005,Pages 133-142,ISSN 0271-5317, https://doi.org/10.1016/j.nutres.2004.12.002.	Prolactin is generally associated with the start of lactation; however, there are evidences clearly indicating that milk PRL is also involved in a variety of physiological functions including differentiation and maturation of neonatal neuroendocrine and immune systems … the stability of PRL levels in the first 3 days of life underlines the essential role of this hormone in the switching on of lactation as well as in the regulation of immune response. … This … supports the indispensable function of IGF-I (insulin-like growth factor-I) in the normal growth and development of infants. *Ook relevant voor studie naar rol insuline*	
Ivan Luzardo-Ocampo, José L. Dena-Beltrán, Xarubet Ruiz-Herrera, Ana Luisa Ocampo-Ruiz, Gonzalo Martínez de la Escalera, Carmen Clapp, Yazmín Macotela,	Women with overweight and obesity can develop mammary gland alterations that unable exclusive breastfeeding. Obesity associates with a disturbed lactating mammary gland endocrine environment including a decreased action	Abstract

Obesity-derived alterations in the lactating mammary gland: Focus on prolactin, Molecular and Cellular Endocrinology, Volume 559, 2023, 111810, ISSN 0303-7207, https://doi.org/10.1016/j.mce.2022.111810.	of the hormone prolactin (PRL), the master regulator of lactation. The PRL receptor and the action of PRL are reduced in the mammary gland of lactating rodents fed an obesogenic diet and are contributing factors to impaired lactation in obesity. Also, treatment with PRL improves milk yield in women with lactation insufficiency.	
Phyllis E. Mann, Robert S. Bridges, Chapter 18 Lactogenic hormone regulation of maternal behavior, Progress in Brain Research, Elsevier, Volume 133, 2001, Pages 251-262, ISSN 0079-6123, ISBN 9780444505484, https://doi.org/10.1016/S0079-6123(01)33019-4.	Overall, these studies indicate that during pregnancy the endocrine system primes the mother's brain so that the new mother displays appropriate and successful behaviors toward her newborn at parturition.	abstract
Ozisik H, Suner A, Cetinkalp S. Prolactin effect on blood glucose and insülin in breastfeeding women. Diabetes Metab Syndr. 2019 May-Jun;13(3):1765-1767. doi: 10.1016/j.dsx.2019.03.045. Epub 2019 Mar 30. PMID: 31235091.	**Diabetes** **Discussion:** In our study, we displayed prolactin was inversely correlated with HbA1c and 2. hour C peptide. Some studies in the past demonstrated that higher prolactin levels had importantly lower prevelance of type 2 diabetes. Our findings supported this situation.	Abstract
Smiley KO, Ladyman SR, Gustafson P, Grattan DR, Brown RSE. Neuroendocrinology and Adaptive Physiology of Maternal Care. Curr Top Behav Neurosci. 2019;43:161-210. doi: 10.1007/7854_2019_122. PMID: 31808002.	Importantly, the hormonal changes associated with pregnancy and lactation also act to coordinate a broad range of physiological changes to support the mother and enable her to adapt to the demands of these states. This chapter will review the neural pathways that regulate maternal behavior, the hormonal changes that occur during pregnancy and lactation, and how these two facets merge together to promote both young-directed maternal responses (including nursing and grooming) and young-related responses (including maternal aggression and other physiological adaptions to support the development of and caring for young)	Abstract
Togha M, Nematgorgani S, Ghorbani Z, Rafiee P, Haghighi S. Increased serum prolactin level may indicate more migraine attack frequency. Brain Behav. 2023 Jul;13(7):e3063. doi: 10.1002/brb3.3063. Epub 2023 May 15. PMID: 37190874; PMCID: PMC10338787.	Migraine bij hogere serum prl	Abstract
Vieira Borba, V., Shoenfeld, Y. Prolactin, autoimmunity, and motherhood: when should women avoid breastfeeding?. *Clin Rheumatol* **38**, 1263–1270 (2019). https://doi.org/10.1007/s10067-018-04415-y	During the pregnancy and lactation period, assorted autoimmune patients experience relapses, suggesting an active interference from increased levels of prolactin. This association was found to be significant in systemic lupus erythematosus, rheumatoid arthritis, and peripartum cardiomyopathy. Furthermore, treatment with bromocriptine has shown beneficial effects specially among systemic lupus erythematosus patients. In this review, we	Abstract

	attempt to provide a critical overview of the link between prolactin, autoimmune diseases, and motherhood, emphasizing whether breastfeeding should be avoided among women, both with diagnosed disease or high risk for its development.	
Wszolek KM, Chmaj-Wierzchowska K, Piet M, Tarka A, Chuchracki M, Muszynska M, Meczekalski B, Wilczak M. Peripartum prolactin and cortisol level changes. A prospective pilot study. Ginekol Pol. 2023;94(6):484-490. doi: 10.5603/GP.a2022.0125. Epub 2022 Nov 15. PMID: 36378127.	Effect leeftijd moeder op prolactine gehalte (ouder = lager) . Eerste 2 uur voeden maakt echt verschil in productie. **Results:** The results showed a significant relationship between maternal age and the level of prolactin measured before childbirth and fluctuations in cortisol level with respect to labor duration. In addition, we observed a strong correlation between the level of prolactin assessed before childbirth and the pH and base excess of the umbilical cord artery. Most importantly, a correlation was noted between breastfeeding within 2 hours after the labor and the level of cortisol measured after childbirth. **Conclusions:** We observed a significant correlation between a summarized labor duration and maternal and umbilical cord cortisol levels measured right after the labor. The fact of breastfeeding within 2 hours after the labor strongly correlated with lower levels of maternal cortisol as well as a cortisol level in umbilical cord blood and it suggests that immediate initiation of breastfeeding reduces stress level for both, mother and newborn.	Abstract