

Geachte diëtist(e),

Uw klant gebruikt mijn boek "SLIM – op uw juiste gewicht" om gewicht te verliezen. In mijn boek behandel ik een aantal lichamelijke stoornissen die gewichtstoename kunnen veroorzaken zoals koolhydraatverslaving, hyperinsulinemie, een verlaagde verbranding, een verminderde verzadiging enz. In mijn boek ga ik er van uit dat afvallen, door op voeding en beweging te letten, meer succes heeft als er ook aandacht is voor deze onderliggende stoornissen.

Door het toepassen van mijn differentiaal diagnostische model heeft uw klant een **verminderde verzadiging** bij zich zelf herkend.

Een verminderde verzadiging kan worden veroorzaakt doordat verzadigingssignalen die in het lichaam worden afgegeven^{1,2} te laat³ of niet goed worden opgemerkt^{4,5}. Kort na een maaltijd voelt uw klant dan dat er toch weer te veel is gegeten. Het kan ook zijn dat het hormoon grehline⁶, dat het hongergevoel stimuleert, bij uw klant verhoogd is. Dat kan worden veroorzaakt door een dieet met een sterke calorierestictie⁷. Maar het kan ook zijn dat uw klant leptineresistent is geworden⁸ waardoor voeding voor uw klant de hele dag door een grote verleiding is⁹.

Een verminderde verzadiging kan het volgen van uw dieetvoorschriften, bij uw klant, in de weg staan.

Om de verzadiging te verbeteren adviseer ik in mijn boek om langzamer¹⁰ en vaker, met behulp van verantwoorde tussendoortjes, te eten^{11,12}. De hoofdmaaltijden moeten wel op deze tussendoortjes worden aangepast. Bovendien adviseer ik in mijn boek een eiwitrijk en vezelrijk ontbijt. Eiwit- en vezelrijke voeding werkt, zoals u weet, sterk verzadigend^{13,14}. Bovendien verminderen eiwitten die tijdens het ontbijt gegeten worden de hele verdere dag het hongergevoel¹⁵ en verbeteren ze de verbranding¹⁶.

Verder zou ik bij een verminderde verzadiging het gebruik van extra voedingsvezels willen adviseren. Een volwassene heeft voor een goede gezondheid eigenlijk 25 - 30 gram vezels per dag nodig^{17,18}. De gemiddelde Nederlander haalt deze maatstaf bij lange na niet. Voor kinderen is een vezelrijke voeding ook erg belangrijk. U kunt op basis van leeftijd via een eenvoudige formule uitrekenen hoeveel vezels een kind per dag nodig heeft:

$$\text{Leeftijd} + 5 = \text{aantal gram vezels per dag}^{19}$$

Vezelrijke voeding, is zoals u, weet zeer belangrijk bij de behandeling van overgewicht²⁶. In mijn boek maak ik gebruik van een vezelmix op basis van psyllium²⁷, glucomannan²⁸, guar gum²⁹, oligofructose³⁰ en alginaat³¹. Deze vezelcombinatie zorgt voor een verbeterde verzadiging en zorgt er ook voor dat koolhydraten langzamer in het lichaam worden opgenomen zodat hongergevoelens langer uitblijven.

Klanten met een BMI van meer dan 25 hebben vaak een sterk verhoogde triglyceridebloedwaarde waardoor ze waarschijnlijk leptineresistent zijn geworden^{20,21}. U kunt, als u dat wilt, het triglycerideniveau in het bloed laten bepalen. Als deze waarde te hoog blijkt te zijn adviseer ik de volgende voedingsinterventie:

- Melkrestictie, omdat melk een leptineresistentie alleen maar erger maakt²¹,
- een fructoserestrictie (natuurlijke vruchtensuiker). Toegevoegde fructose verhoogt de triglyceriden²², verlaagt de leptine²³- en verhoogt de ghreline (hongerhormoon) niveau²². Dat is het slechtst denkbare scenario voor iemand die gewicht wil verliezen.
- en 2 - 3 maal per week vette vis. DHA in vette vis verlaagt het triglycerideniveau^{24,25}.

Wilt u zo vriendelijk zijn om te zien of bovenstaande binnen uw behandeling in te passen is.

Voor eventuele vragen over deze manier van behandelen ben ik voor u via telefoon en email beschikbaar.

Met vriendelijke groet,

Cora de Fluiter

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Referenties

Belangrijk: print deze referentielijst ook uit diëtist(e)

1. [Dhillon WS, Bloom SR. Horm Metab Res.](#) 2004 Nov-Dec;36(11-12):846-51
Gastrointestinal hormones and regulation of food intake
Several peptides synthesised in the gastrointestinal tract which affect food intake have been identified including ghrelin, cholecystokinin (CCK), glucagon-like peptide-1 (7-36) amide (GLP-1), oxyntomodulin, peptide YY (PYY) and pancreatic polypeptide (PP).
<http://www.ncbi.nlm.nih.gov/pubmed/15655718>
2. [Sahu A. Front Neuroendocrinol.](#) 2003 Dec;24(4):225-53 **Leptin signaling in the hypothalamus: emphasis on energy homeostasis and leptin resistance**
Leptin, the long-sought factor of adipocytes origin, has emerged as one of the major signals that relay the status of fat stores to the hypothalamus and plays a significant role in energy homeostasis. It is now established that central leptin resistance contributes to the development of diet-induced obesity and ageing associated obesity.
<http://www.ncbi.nlm.nih.gov/pubmed/14726256>
3. [Erlanson-Albertsson C. Acta Paediatr Suppl.](#) 2005 Jun;94(448):40-1. **Appetite regulation and energy balance**
Thirty minutes after the start of eating, satiety signals arise from the intestinal tract and, in between meals, from the adipose tissue and liver. Satiety signals are sedative and arrest the processing of food in the intestine, hence leading to termination of eating.
<http://www.ncbi.nlm.nih.gov/pubmed/16175806>
4. [Small CJ, Bloom SR. Curr Drug Targets CNS Neurol Disord.](#) 2004 Oct;3(5):379-88 **Gut hormones as peripheral anti obesity targets**
Obese subjects have lower basal fasting PYY levels and have a smaller post prandial rise.
<http://www.ncbi.nlm.nih.gov/pubmed/15544446>
5. [Goldstone AP. Prog Brain Res.](#) 2006;153:57-73 **The hypothalamus, hormones, and hunger: alterations in human obesity and illness**
While obese subjects have appropriate reductions in orexigenic ghrelin, other gut-hormone disturbances may contribute to obesity such as reduced anorexigenic PYY and PP.
<http://www.ncbi.nlm.nih.gov/pubmed/16876568>
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Influence of ghrelin on food intake and energy homeostasis
Ghrelin is an endogenous orexigenic peptide recently discovered in the stomach. Ghrelin is involved in short-term regulation of food intake since its plasma levels increase before

meals and decrease strongly postprandially.
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Weight loss resulting from decreased caloric intake raises levels of the orexigenic hormone, ghrelin..
<http://jcem.endojournals.org/cgi/content/full/90/2/820>
8. [Sahu A](#). [Front Neuroendocrinol](#). 2003 Dec;24(4):225-53 **Leptin signaling in the hypothalamus: emphasis on energy homeostasis and leptin resistance**
Leptin, the long-sought factor of adipocytes origin, has emerged as one of the major signals that relay the status of fat stores to the hypothalamus and plays a significant role in energy homeostasis. It is now established that central leptin resistance contributes to the development of diet-induced obesity and ageing associated obesity.
<http://www.ncbi.nlm.nih.gov/pubmed/14726256>
9. [Scarpace PJ](#), [Zhang Y](#). [Front Biosci](#). 2007 May 1;12:3531-44 **Elevated leptin: consequence or cause of obesity?**
Once leptin resistance takes hold, each subsequent exposure to high-density food faces diminished counter-regulatory responses, leading to exacerbated weight gain.
<http://www.ncbi.nlm.nih.gov/pubmed/17485319>
10. [Andrade AM](#), [Greene GW](#), [Melanson KJ](#). [J Am Diet Assoc](#). 2008 Jul;108(7):1186-91 **Eating slowly led to decreases in energy intake within meals in healthy women**
Ad libitum energy intake was lower when the meal was eaten slowly, and satiety was higher at meal completion. Although more study is needed, these data suggest that eating slowly may help to maximize satiation and reduce energy intake within meals.
<http://www.ncbi.nlm.nih.gov/pubmed/18589027>
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Obese males fed an isoenergetic pre-load sub-divided into a multi-meal plan consumed 27% less at a subsequent ad libitum test meal than did the same men when given the pre-load as a single meal. Prolonged but attenuated increases in serum insulin concentration on the multi-meal programme may facilitate this acute reduction in appetite.
<http://www.ncbi.nlm.nih.gov/pubmed/10578205>
12. [Speechly DP](#), [Buffenstein R](#). [Appetite](#). 1999 Dec;33(3):285-97. **Greater appetite control associated with an increased frequency of eating in lean males**
These data suggest that when the nutrient load was spread into equal amounts and consumed evenly through the day in lean healthy males, there was an enhanced control of appetite. This greater control of satiety when consuming smaller multiple meals may possibly be linked to an attenuation in insulin response although clearly both other physical (gastric stretch) and physiological (release of gastric hormones) factors may also be affected by the periodicity of eating.
<http://www.ncbi.nlm.nih.gov/pubmed/10625522>
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Protein is more satiating than carbohydrate and fat in the short term, over 24 h and in the long term. Thermogenesis plays a role in this satiety effect, but the role of satiety hormones still needs to be elucidated. On the short-term 'fast' proteins are more satiating than 'slow' proteins, and animal protein induces a higher thermogenesis than vegetable protein.
<http://www.ncbi.nlm.nih.gov/pubmed/14557793>
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This study demonstrated that moderate dietary fibre supplementation in normal man increases faecal energy excretion with simultaneously decreased hunger feeling. These beneficial effects may have therapeutic value in the management of obesity.
<http://www.ncbi.nlm.nih.gov/pubmed/3032828>

15. [Blom WA](#), [Lluch A](#), [Stafleu A](#), [Vinoy S](#), [Holst JJ](#), [Schaafsma G](#), [Hendriks HF](#). [Am J Clin Nutr](#). 2006 Feb;83(2):211-20 **Effect of a high-protein breakfast on the postprandial ghrelin response**
The HP breakfast decreased postprandial ghrelin concentrations more strongly over time than did the HC breakfast. The HP breakfast also reduced gastric emptying, probably through increased secretion of cholecystokinin and glucagon-like peptide 1.
<http://www.ajcn.org/cgi/content/full/83/2/211>
16. [Lejeune MP](#), [Westerterp KR](#), [Adam TC](#), [Luscombe-Marsh ND](#), [Westerterp-Plantenga MS](#). [Am J Clin Nutr](#). 2006 Jan;83(1):89-94 [Am J Clin Nutr](#). 2006 Jan;83(1):89-94 **Ghrelin and glucagon-like peptide 1 concentrations, 24-h satiety, and energy and substrate metabolism during a high-protein diet and measured in a respiration chamber.**
An HP diet, compared with an AP diet, fed at energy balance for 4 d increased 24-h satiety, thermogenesis, sleeping metabolic rate, protein balance, and fat oxidation. Satiety was related to protein intake, and incidentally to ghrelin and GLP-1 concentrations, only during the HP diet.
<http://www.ajcn.org/cgi/content/full/83/1/89>
17. [Rubio MA](#). [Nutr Hosp](#). 2002;17 Suppl 2:17-29 **Implications of fiber in different pathologies**
Three decades ago, the observations of Trowell and Burkitt gave rise to the "fibre theory", in which it was contended that there was a link between the consumption of a diet rich in fibre and non-processed carbohydrates and the level of protection against many of the "first world diseases" such as constipation, diverticulosis, cancer of the colon, diabetes, obesity and cardiovascular disease. A high fibre intake (> 25-30 g/day) based on a variety of food sources (fruit, vegetable, legumes, cereals) is the only way to avoid many of the disorders mentioned.
<http://www.ncbi.nlm.nih.gov/pubmed/12141181>
18. [Marlett JA](#), [McBurney MI](#), [Slavin JL](#); [American Dietetic Association](#). [J Am Diet Assoc](#). 2002 Jul;102(7):993-1000. **Position of the American Dietetic Association: health implications of dietary fiber**
Dietary fiber consists of the structural and storage polysaccharides and lignin in plants that are not digested in the human stomach and small intestine. A wealth of information supports the American Dietetic Association position that the public should consume adequate amounts of dietary fiber from a variety of plant foods. Recommended intakes, 20-35 g/day for healthy adults and age plus 5 g/day for children, are not being met, because intakes of good sources of dietary fiber, fruits, vegetables, whole and high-fiber grain products, and legumes are low.
<http://www.ncbi.nlm.nih.gov/pubmed/12146567>
19. [Williams CL](#). [J Am Diet Assoc](#). 1995 Oct;95(10):1140-6, 1149; quiz 1147-8 **Importance of dietary fiber in childhood**
Currently, children consume amounts of dietary fiber that appear to be inadequate for optimal health promotion and disease prevention. It is prudent to recommend that children older than 2 years of age increase dietary fiber intake to an amount equal to or greater than their age + 5 g/day. According to the "age + 5" rule dietary fiber intake would increase from 8 g/day at age 3 years to 25 g/day by age 20 years.
<http://www.ncbi.nlm.nih.gov/pubmed/7560686>
20. [Hwang LC](#), [Tsai CH](#), [Chen TH](#). [J Formos Med Assoc](#). 2006 Jan;105(1):56-63 **Overweight and obesity-related metabolic disorders in hospital employees**
The risks attributable to obesity (baseline BMI $\geq$ 25 kg/m²) were 23.0% for hypertension, 70.8% for diabetes, 27.9% for hypertriglyceridemia, and 24.1% for hyperuricemia.
<http://www.ncbi.nlm.nih.gov/pubmed/16440071>
21. Banks WA, Coon AB, Robinson SM, Moinuddin A, Shultz JM, Nakaoke R, Morley JE. [Diabetes](#). 2004 May;53(5):1253-60 **Triglycerides induce leptin resistance at the blood-brain barrier**
Here, we show that milk, for which fats are 98% triglycerides, immediately inhibited leptin transport as assessed with in vivo, in vitro, and in situ models of the BBB. Fat-free milk and intralipid, a source of vegetable triglycerides, were without effect. We conclude that triglycerides are an important cause of leptin resistance as mediated by impaired transport across the BBB and suggest that triglyceride-mediated leptin resistance may have evolved

as an anti-anorectic mechanism during starvation.

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22. [Teff KL](#), [Elliott SS](#), [Tschöp M](#), [Kieffer TJ](#), [Rader D](#), [Heiman M](#), [Townsend RR](#), [Keim NL](#), [D'Alessio D](#), [Havel PJ](#). *J Clin Endocrinol Metab*. 2004 Jun;89(6):2963-72 **Dietary fructose reduces circulating insulin and leptin, attenuates postprandial suppression of ghrelin, and increases triglycerides in women**
Consumption of HFr meals produced a rapid and prolonged elevation of plasma triglycerides compared with the HGI day ($P < 0.005$). Because insulin and leptin, and possibly ghrelin, function as key signals to the central nervous system in the long-term regulation of energy balance, decreases of circulating insulin and leptin and increased ghrelin concentrations, as demonstrated in this study, could lead to increased caloric intake and ultimately contribute to weight gain and obesity during chronic consumption of diets high in fructose.
<http://jcem.endojournals.org/cgi/content/full/89/6/2963>
23. [Elliott SS](#), [Keim NL](#), [Stern JS](#), [Teff K](#), [Havel PJ](#). *Am J Clin Nutr*. 2002 Nov;76(5):911-22 **Fructose, weight gain, and the insulin resistance syndrome**
Because leptin production is regulated by insulin responses to meals, fructose consumption also reduces circulating leptin concentrations. The combined effects of lowered circulating leptin and insulin in individuals who consume diets that are high in dietary fructose could therefore increase the likelihood of weight gain and its associated metabolic sequelae.
<http://www.ajcn.org/cgi/content/full/76/5/911>
24. [Davidson MH](#), [Maki KC](#), [Kalkowski J](#), [Schaefer EJ](#), [Torri SA](#), [Drennan KB](#). *J Am Coll Nutr*. 1997 Jun;16(3):236-43 **Effects of docosahexaenoic acid on serum lipoproteins in patients with combined hyperlipidemia: a randomized, double-blind, placebo-controlled trial.**
These preliminary findings suggest that dietary supplementation with 1.25 g DHA/day, provided in a triglyceride form, may be an effective tool to aid in the management of hypertriglyceridemia.
<http://www.ncbi.nlm.nih.gov/pubmed/9176830>
25. [Kelley DS](#), [Siegel D](#), [Vemuri M](#), [Mackey BE](#). *Am J Clin Nutr*. 2007 Aug;86(2):324-33 **Docosahexaenoic acid supplementation improves fasting and postprandial lipid profiles in hypertriglyceridemic men.**
DHA supplementation may improve cardiovascular health by lowering concentrations of triacylglycerols and small, dense LDL particles.
<http://www.ajcn.org/cgi/content/full/86/2/324>
26. [Rigaud D](#), [Ryttig KR](#), [Leeds AR](#), [Bard D](#), [Apfelbaum M](#). *Int J Obes*. 1987;11 Suppl 1:73-8 **Effects of a moderate dietary fibre supplement on hunger rating, energy input and faecal energy output in young, healthy volunteers. A randomized, double-blind, cross-over trial**
This study demonstrated that moderate dietary fibre supplementation in normal man increases faecal energy excretion with simultaneously decreased hunger feeling. These beneficial effects may have therapeutic value in the management of obesity.
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27. [Rigaud D](#), [Paycha F](#), [Meulemans A](#), [Merrouche M](#), [Mignon M](#). *Eur J Clin Nutr*. 1998 Apr;52(4):239-45 **Effect of psyllium on gastric emptying, hunger feeling and food intake in normal volunteers: a double blind study**
Psyllium reduces hunger feelings and energy intake in normal volunteers at reasonable dose and without requiring mixing with the meal. It does not act by slowing down the gastric emptying of hydrosoluble nutrients, but by increase in the time allowed for intestinal absorption, as suggested by the flattening of the postprandial serum glucose, insulin and triglycerides curves.
<http://www.ncbi.nlm.nih.gov/pubmed/9578335>
28. [Keithley J](#), [Swanson B](#). *Altern Ther Health Med*. 2005 Nov-Dec;11(6):30-4 **Glucomannan and obesity: a critical review.**
At doses of 2-4 g per day, GM was well-tolerated and resulted in significant weight loss in overweight and obese individuals. There is some evidence that GM exerts its beneficial effects by promoting satiety and fecal energy loss. Additionally, GM has been shown to

improve lipid and lipoprotein parameters and glycemic status.

<http://www.ncbi.nlm.nih.gov/pubmed/16320857>

29. [Heini AF](#), [Lara-Castro C](#), [Schneider H](#), [Kirk KA](#), [Considine RV](#), [Weinsier RL](#). [Int J Obes Relat Metab Disord](#). 1998 Sep;22(9):906-9 **Effect of hydrolyzed guar fiber on fasting and postprandial satiety and satiety hormones: a double-blind, placebo-controlled trial during controlled weight loss**

The results indicated that a hydrolyzed guar gum fiber supplement produced a heightened postprandial CCK response, but did not alter other satiety hormones or increase satiety ratings, in either the fasting or the postprandial state

<http://www.ncbi.nlm.nih.gov/pubmed/9756250>

30. [Cani PD](#), [Joly E](#), [Horsmans Y](#), [Delzenne NM](#). [Eur J Clin Nutr](#). 2006 May;60(5):567-72 **Oligofructose promotes satiety in healthy human: a pilot study**

Oligofructose treatment increases satiety following breakfast and dinner, reduces hunger and prospective food consumption following dinner. This pilot study presents a rationale to propose oligofructose supplements in the management of food intake in overweight and obese patients

<http://www.ncbi.nlm.nih.gov/pubmed/16340949>

31. [Torsdottir I](#), [Alpsten M](#), [Holm G](#), [Sandberg AS](#), [Tölli J](#). [J Nutr](#). 1991 Jun;121(6):795-9 **A small dose of soluble alginate-fiber affects postprandial glycemia and gastric emptying in humans with diabetes.**

Sodium alginate also induced significantly lower postprandial rises in blood glucose, serum insulin and plasma C-peptide. The diminished glucose response after the addition of sodium alginate could be correlated to the delayed gastric emptying rate induced by the fiber ($r_s = 0.92$, P less than 0.01).

<http://jn.nutrition.org/cgi/reprint/121/6/795.pdf>