



MYTH OR SCIENCE: IS SKIPPING BREAKFAST GOOD FOR YOU?

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Critical Appraisal

'Breakfast is the most important meal of the day' is a well-known phrase. In line with this, Adelle Davis, considered as the most famous nutritionist in the early to mid-20th century, popularised the following mantra: '*Eat breakfast like a king, lunch like a prince and dinner like a pauper*', since breakfast would energise one for the day to come [1]. In the Netherlands, however, almost one in five women and even one in three men aged 19 to 50 years old do not eat breakfast on a daily basis. This percentage is lower in people aged over 50. In this population group, 87% of females and 82% of males consume breakfast daily [2]. Contradictory to the previous statement, some nutritionists state that skipping breakfast is not so bad at all [3]. Thus, disagreement exists on whether skipping breakfast is desirable. Therefore, this article aims to explore whether skipping breakfast in the morning is healthy for you or not.

Introduction

If one wants to maintain body mass, it is vital to consume enough energy throughout the day to keep a good balance between daily energy expenditure and consumption. This balance is essential since enough energy should be present for dietary-induced thermogenesis, energy usage in the resting metabolic rate and activity-induced thermogenesis (e.g. daily life activities), which make up the three components of daily energy expenditure [4]. A healthy food pattern requires the recommended intake of several nutrients in the food. These nutrients include proteins, fats and lipids, carbohydrates, several vitamins, minerals and trace elements [5]. When looking to maintain body mass, one should neither eat too much nor too little. Vegetables, fruit, legumes, fish, wholemeal products, nuts and few animal products are all characteristic food products of a healthy diet [6]. In the Netherlands, breakfast provides 14% of the total daily energy intake, compared to lunch (21%), dinner (36%) and in-between meals (30%) [7]. However, almost one in five women and even one in three men aged 19 to 50 years old do not consume breakfast on a daily basis. This percentage is lower in people aged over 50. In this population group, 13% of females and 18% of males skip their daily breakfast [2]. One reason for this breakfast skipping behaviour is lack of time before going to work in the morning [8]. Although some nutritionists advocate that skipping breakfast is not as bad as we think it is, official nutrition guidelines to date recommend that we do not skip our breakfast [9]. So, what should we believe? Is skipping breakfast in the morning recommended or not, or does it perhaps not make a difference at all?

Pros and cons of daily breakfast consumption

Eating your breakfast in the morning has been found to have several advantages over skipping your daily breakfast meal. First of all, Giovannini *et al.* suggest in their paper that eating breakfast lowers the risk of several chronic diseases [10]. This article suggests that skipping breakfast may lead to the upregulation of appetite, which could possibly lead to weight gain and alterations in risk factors for cardiovascular disease and diabetes, as well as that it may have an association with a poorer overall quality of the diet. This article cites studies which report that an increased meal frequency induces changes in metabolism in favour of risk factors for chronic diseases and thereby lowers the risk of chronic diseases.

Furthermore, two cross-sectional studies found that eating breakfast reduces

overweight and obesity [11, 12]. According to the first study, this finding could possibly be explained by a more equal distribution of energy intake across meals throughout the day when not skipping breakfast. According to the second study, it is suggested that breakfast skippers tend to eat more foods containing low nutrient or high energy density or they may consume more discretionary energy at other meals. In addition, this article suggests that skipping your breakfast may lead to excess hunger, which could lead to overeating and subsequently result in both the consumption of larger food portions and increased eating frequency.

Although there is evidence in favour of eating your breakfast, scientifically underpinned evidence for skipping your breakfast also exists. The studies described above indicating that breakfast skipping is associated with both chronic diseases as well as overweight and obesity were all observational studies. Because of this, a causal relationship between breakfast skipping and weight status/chronic disease risk is hard to establish. It could, for example, have been the case that people who eat breakfast already tend to have a healthier diet containing more fibres and micronutrients and that these people are also likely to be more physically active [13, 14]. Conversely, breakfast-skipping individuals are more likely to have an unhealthy lifestyle, including smoking behaviour, excess alcohol consumption and a low physical activity level [15].

In addition, some people advocate for the fact that eating breakfast boosts your metabolism at the beginning of the day. Though this sounds quite logical, this has not been proven, since a randomised crossover design study evaluating the effect of breakfast skipping on energy metabolism found no differences in calories burned over 24 hours between people who skip and who do not skip breakfast [16]. This could possibly be explained by the aforementioned components of energy expenditure: because of dietary-induced thermogenesis, it is true that eating breakfast or any other meal raises the metabolic rate. However, this dietary-induced fraction is always a fraction of the energy content of the meal and so for the immediate energy balance, the ingested energy will not completely be expended by this dietary-induced thermogenesis, since the resting metabolic rate and activity-induced thermogenesis also use energy [4].

Moreover, as discussed earlier on, it has been debated that you can become so hungry when skipping breakfast that you tend to overeat at other meals of the day, resulting in weight gain. However, some studies investigating the relationship between breakfast consumption and energy intake have shown that skipping your breakfast may even reduce your total calorie

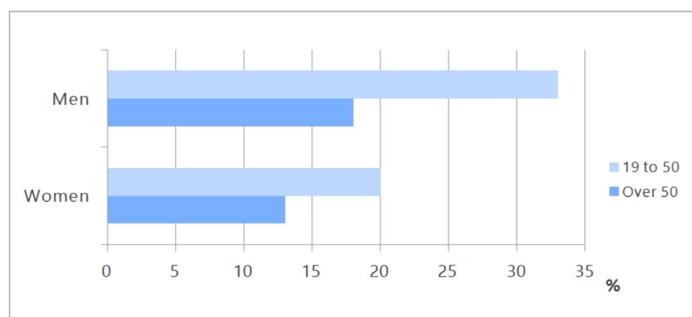


Figure 1: Percentages of daily breakfast skipping behaviour per age category for males and females.

intake per day by up to 400 calories, despite the fact that hunger rating and intake at lunch significantly increased after breakfast skipping [17-19]. Thus, these studies conclude that skipping breakfast does not necessarily result in compensation for the missing energy. Yet, a randomised controlled trial of high quality compared recommendations on whether to eat or skip breakfast in overweight and obese individuals and they found that there was no difference in weight between the groups after four months [20]. These results were supported by a couple of other studies [13, 21]. Additionally, breakfast skipping can result in lower energy intake across the day, and it also seems to result in lower physical activity thermogenesis [22]. Thus, there is no conclusive statement on the effect on weight after skipping breakfast.

Conclusion

Although some observational studies conclude that breakfast consumption causes less overweight and obesity as well as that it lowers the risk of several chronic diseases, these statements can be refuted by the fact that the studies that opted these findings are observational and thus no causal inference is possible. This means that no statement can be made on whether or not eating breakfast really has the potential to reduce overweight/obesity and the risk of chronic diseases.

Moreover, this article found that there were no differences in calories burned over 24 hours between breakfast-skippers and breakfast-consumers as well as that no definite statement can be made on whether or not breakfast skipping results in weight gain or weight loss. This could be explained by evidence that indicates that breakfast consumption may result in an increased energy expenditure and intake, as well as higher physical activity thermogenesis.

In conclusion, skipping breakfast is not especially bad or good for you. Since the evidence suggests that neither your metabolism is boosted by eating breakfast, nor does skipping breakfast automatically lead to overeating, it can be concluded that it just depends on what you eat during the rest of the day. So, feeling hungry in the morning? Grab some breakfast. Are you not in the mood for food? No worries, just skip it!

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References

1. Spence, M. Breakfast: The most important meal of the day? *International Journal of Gastronomy and Food Science* **8**, 1-6 (2017).
2. Van Rossum, C.T.M., et al. The diet of the Dutch; Results of the first two years of the Dutch National Food Consumption Survey 2012-2016. Bilthoven: RIVM (2016).

3. Ontbijt kun je best overslaan. NU.nl, (2017, March 16th). Retrieved from: <https://www.nu.nl/eten-en-drinken/4524369/ontbijt-kun-best-overslaan.html/> (Accessed: 4th December 2019).
4. Westerterp, K.R. Diet induced thermogenesis. *Nutrition & metabolism* **1**, 5 (2004).
5. Nutrition. World Health Organization. Retrieved from: <https://www.who.int/nutrition/topics/nutrecomm/en/> (Accessed: 4th December 2019).
6. Healthy nutrition. RIVM. (2017, November 13th). Retrieved from: <https://www.rivm.nl/en/healthy-nutrition> (Accessed: 4th December 2019).
7. Van Rossum, C.T.M., Fransen, H.P., Verkaik-Kloosterman, J., Buurma, E.M., Ocké, M.C. Dutch National Food Consumption Survey 2007-2010: Diet of children and adults aged 7 to 69 years. Bilthoven: RIVM (2011).
8. Nederlanders 'te gehaast' voor goed ontbijten. NU.nl. (2017, February 13th). Retrieved from: <https://www.nu.nl/eten-en-drinken/4452897/nederlanders-te-gehaast-goed-ontbijten.html> (Accessed: 4th December 2019).
9. Is ontbijt overslaan erg? Voedingscentrum. Retrieved from: <https://www.voedingscentrum.nl/nl/service/vraag-en-antwoord/gezonde-voeding-en-voedingsstoffen/is-ontbijt-overslaan-erg.aspx> (Accessed: 4th December 2019).
10. Giovannini, M., et al. Symposium overview: Do we all eat breakfast and is it important? *Critical reviews in food science and nutrition* **50**, 97-99 (2010).
11. Dubois, L., et al. Breakfast skipping is associated with differences in meal patterns, macronutrient intakes and overweight among pre-school children. *Public health nutrition* **12**, 19-28 (2009).
12. Deshmukh-Taskar, P.R., et al. The relationship of breakfast skipping and type of breakfast consumption with nutrient intake and weight status in children and adolescents: the National Health and Nutrition Examination Survey 1999-2006. *Journal of the American Dietetic Association* **110**, 869-878 (2010).
13. Rampersaud, G.C., et al. Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *Journal of the American Dietetic Association* **105**, 743-760; quiz 761-742 (2005).
14. O'neil, C.E., et al. Nutrient intake, diet quality, and weight/adiposity parameters in breakfast patterns compared with no breakfast in adults: National Health and Nutrition Examination Survey 2001-2008. *Journal of the Academy of Nutrition and Dietetics* **114**, S27-43 (2014).
15. Cahill, L.E., et al. Prospective study of breakfast eating and incident coronary heart disease in a cohort of male US health professionals. *Circulation* **128**, 337-343 (2013).
16. Kobayashi, F., et al. Effect of breakfast skipping on diurnal variation of energy metabolism and blood glucose. *Obesity research & clinical practice* **8**, e201-298 (2014).
17. Gonzalez, J.T., et al. Breakfast and exercise contingently affect postprandial metabolism and energy balance in physically active males. *The British journal of nutrition* **110**, 721-732 (2013).
18. Levitsky, D.A. & Pacanowski, C.R. Effect of skipping breakfast on subsequent energy intake. *Physiology & behavior* **119**, 9-16 (2013).
19. Geliebter, A., et al. Skipping breakfast leads to weight loss but also elevated cholesterol compared with consuming daily breakfasts of oat porridge or frosted cornflakes in overweight individuals: a randomised controlled trial. *Journal of nutritional science* **3**, e56 (2014).
20. Dhurandhar, E.J., et al. The effectiveness of breakfast recommendations on weight loss: a randomized controlled trial. *The American journal of clinical nutrition* **100**, 507-513 (2014).
21. Mccrory, M.A. Meal skipping and variables related to energy balance in adults: a brief review, with emphasis on the breakfast meal. *Physiology & behavior* **134**, 51-54 (2014).
22. Betts, J.A., et al. The causal role of breakfast in energy balance and health: a randomized controlled trial in lean adults. *The American journal of clinical nutrition* **100**, 539-547 (2014).