Tackling Obesity with Therapeutic Carbohydrate Restriction

'Overall, a low-carb diet appears to be among the most effective approaches for weight loss and body fat reduction.' Akbari et al., 2024

February, 2025 Nutrition Network

Compiled by

Sarah Rice BSc. (Hons), MCOptom (UK), MHP, NNP

Systematic Reviews and Meta-analyses

1. Choi, Y.J., Jeon, S.-M. and Shin, S. (2020) 'Impact of a Ketogenic Diet on Metabolic Parameters in Patients with Obesity or Overweight and with or without Type 2 Diabetes: A Meta-Analysis of Randomized Controlled Trials', *Nutrients*, 12(7), p. 2005. Available at: https://doi.org/10.3390/nu12072005.

2. Sackner-Bernstein, J., Kanter, D. and Kaul, S. (2015) 'Dietary Intervention for Overweight and Obese Adults: Comparison of Low-Carbohydrate and Low-Fat Diets. A Meta-Analysis', *PloS One*, 10(10), p. e0139817. Available at: https://doi.org/10.1371/journal.pone.0139817.

3. Liao, T. *et al.* (2024) 'The impact of 3 different dietary interventions on overweight or obese adults: A network meta-analysis', *Medicine*, 103(42), p. e39749. Available at: https://doi.org/10.1097/MD.0000000000039749.

Studies

1. Ebbeling, C.B. *et al.* (2018) 'Effects of a low carbohydrate diet on energy expenditure during weight loss maintenance: randomized trial', *BMJ (Clinical research ed.)*, 363, p. k4583. Available at: https://doi.org/10.1136/bmj.k4583.

2. Goss, A.M. *et al.* (2020) 'Effects of weight loss during a very low carbohydrate diet on specific adipose tissue depots and insulin sensitivity in older adults with obesity: a randomized clinical trial', *Nutrition & Metabolism*, 17(1), p. 64. Available at: https://doi.org/10.1186/s12986-020-00481-9.

3. Saslow, L.R. *et al.* (2023) 'Comparing Very Low-Carbohydrate vs DASH Diets for Overweight or Obese Adults With Hypertension and Prediabetes or Type 2

Diabetes: A Randomized Trial', *Annals of Family Medicine*, 21(3), pp. 256–263. Available at: https://doi.org/10.1370/afm.2968.

Appetite Control and Hunger Signalling

1. Černelič-Bizjak, M. et al. (2023) 'Link between emotional and external eating behaviors, peripheral neuropeptide Y, and β-hydroxybutyrate in participants with obesity on 12-week ketogenic diet', Nutrition and Health, p. 026010602311544. Available at: https://doi.org/10.1177/02601060231154464.

2. Johnstone, A.M. *et al.* (2008) 'Effects of a high-protein ketogenic diet on hunger, appetite, and weight loss in obese men feeding ad libitum', *The American Journal of Clinical Nutrition*, 87(1), pp. 44–55. Available at: https://doi.org/10.1093/ajcn/87.1.44.

3. Gibson, A.A. *et al.* (2015) 'Do ketogenic diets really suppress appetite? A systematic review and meta-analysis', *Obesity Reviews*, 16(1), pp. 64–76. Available at: https://doi.org/10.1111/obr.12230.

Lipoedema and Lymphodema

Lymphoedema and lipoedema are conditions associated with obesity that are often misdiagnosed and misunderstood.

1. Lodewijckx, I. *et al.* (2024) 'Potential therapeutic effect of a ketogenic diet for the treatment of lymphoedema: Results of an exploratory study', *Journal of Human Nutrition and Dietetics: The Official Journal of the British Dietetic Association* [Preprint]. Available at: https://doi.org/10.1111/jhn.13330.

2. Amato, A.C.M., Amato, J.L.S. and Benitti, D.A. (2024) 'The Efficacy of Ketogenic Diets (Low Carbohydrate; High Fat) as a Potential Nutritional Intervention for Lipedema: A Systematic Review and Meta-Analysis', *Nutrients*, 16(19), p. 3276. Available at: https://doi.org/10.3390/nu16193276.

3. Lundanes, J. *et al.* (2024) 'Effect of a low-carbohydrate diet on pain and quality of life in female patients with lipedema: a randomized controlled trial', *Obesity*, 32(6), pp. 1071–1082. Available at: https://doi.org/10.1002/oby.24026.

Other Benefits

1. da Silva Schmitt, C. *et al.* (2023) 'The effects of a low carbohydrate diet on erectile function and serum testosterone levels in hypogonadal men with metabolic syndrome: a randomized clinical trial', *BMC Endocrine Disorders*, 23, p. 30. Available at: https://doi.org/10.1186/s12902-023-01278-6.

2. Kackley, M.L. *et al.* (2024) 'Self-reported menses physiology is positively modulated by a well-formulated, energy-controlled ketogenic diet vs. low fat diet in

women of reproductive age with overweight/obesity', *PLOS ONE*. Edited by L. Yanes Cardozo, 19(8), p. e0293670. Available at: https://doi.org/10.1371/journal.pone.0293670.

3. Gjuladin-Hellon, T. *et al.* (2019) 'Effects of carbohydrate-restricted diets on low-density lipoprotein cholesterol levels in overweight and obese adults: a systematic review and meta-analysis', *Nutrition Reviews*, 77(3), pp. 161–180. Available at: https://doi.org/10.1093/nutrit/nuy049.

General Resources - Implementation and De-prescribing

1. Hite, A. et al. (2022) Clinical Guidelines, Society of Metabolic Health Practitioners.

2. Kelly, T., Unwin, D. and Finucane, F. (2020) 'Low-Carbohydrate Diets in the Management of Obesity and Type 2 Diabetes: A Review from Clinicians Using the Approach in Practice', *International Journal of Environmental Research and Public Health*, 17(7), p. 2557. Available at: https://doi.org/10.3390/ijerph17072557.

3. Volek, J.S., Kackley, M.L. and Buga, A. (2024) 'Nutritional Considerations During Major Weight Loss Therapy: Focus on Optimal Protein and a Low-Carbohydrate Dietary Pattern', Current Nutrition Reports [Preprint]. Available at: https://doi.org/10.1007/s13668-024-00548-6.

Further resources

The metabolic section of the Nutrition Network reference resource has an extensive listing where you can read more about the application of therapeutic carbohydrate restriction (TCR) for obesity, lymphoedema, lipoedema and other associated conditions.

Nutrition Network offers training modules where you can learn more about the science and application of TCR for the treatment of obesity and other chronic conditions.