

# A Ketogenic Diet May Improve Weight Loss

## A Review of the Literature

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### BACKGROUND

- In popular literature, a ketogenic diet is accepted as a restriction of dietary carbohydrates <20 -50 grams/day and/or <10% of total daily caloric intake, in order to preferentially produce ketones from body fat for energy metabolism. Healthy fats become the main source of calories.
- Recent popular interest has shifted from a low-fat diet to a low-carbohydrate diet, also known as a ketogenic diet, for weight loss.
- A low-fat diet is dietary fat intake <30% of total daily caloric intake.
- Purported benefits of a ketogenic diet include improved glycemic control and preferential fat loss.
- Safety concerns regarding high fat intake on lipid levels and potentially, cardiovascular health.

### OBJECTIVE

To evaluate the literature regarding the efficacy and safety of a ketogenic diet, compared to a usual or low-fat diet.

### METHODS

PubMed Search (May 24, 2018)

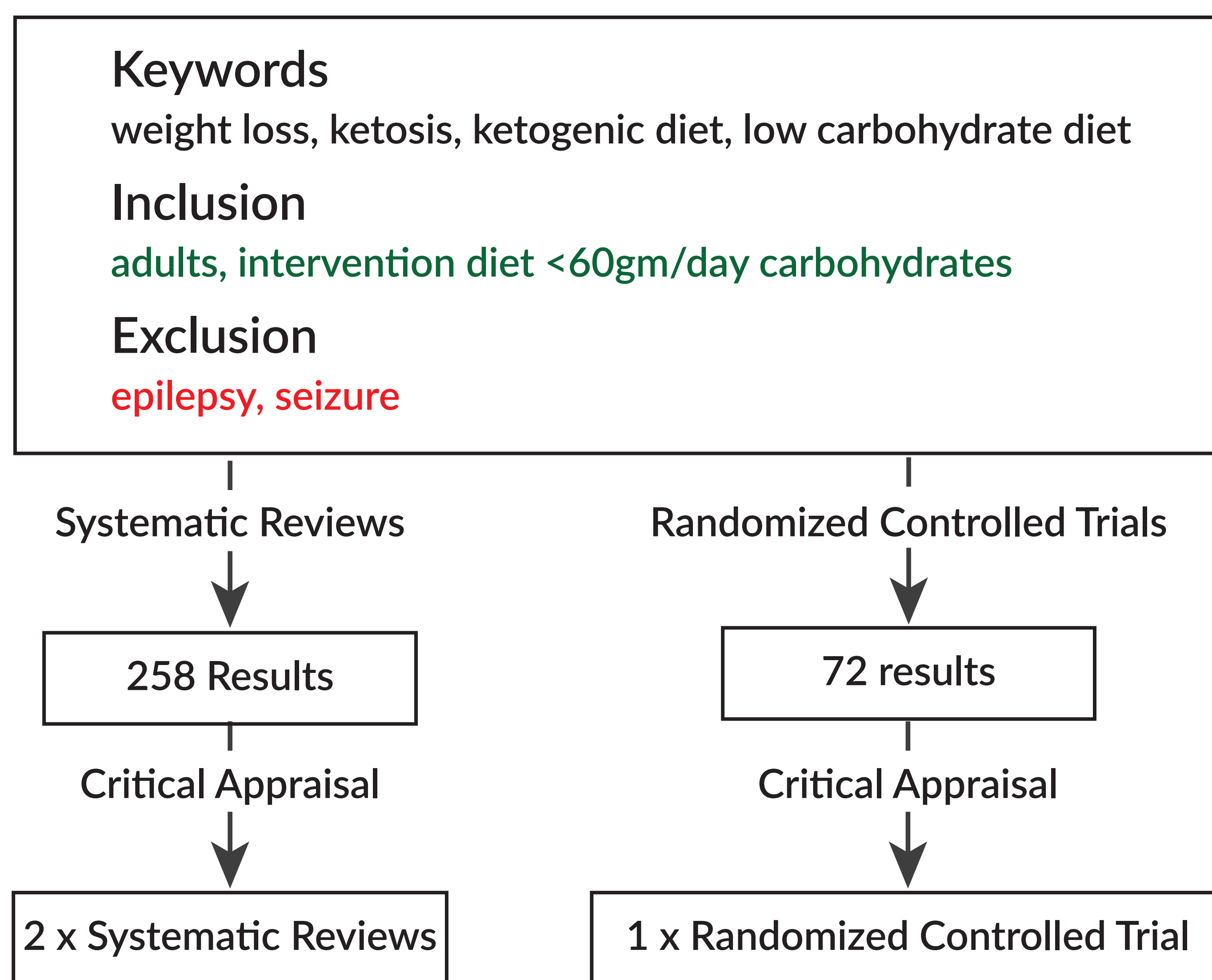


FIGURE 1 Search Strategy

**A ketogenic diet can improve average weight loss up to 2kg, compared to a low-fat diet. However, is difficult to sustain and has similar range of weight loss to other diets.**



Scan for original publication and references

### RESULTS

TABLE 1 Included Studies

	Number of studies	Total participants, N	Intervention Diet	Comparison Diet
Mansoor et al 2016 <sup>2</sup> (SR)	11 RCTs	1369	20-40g carbohydrates first phase, or carbohydrates <20% daily calories	Fat <30% daily calories
Bueno et al 2013 <sup>1</sup> (SR)	13 RCTs	1577	<50g/day carbohydrates or carbohydrates <10% daily calories	Fat <30% daily calories
Gardner et al 2018 <sup>9</sup> (RCT)	N/A	609	Reduce to goal of 20g/day carbohydrates then increase by 5-15g/week until lowest maintenance intake	Reduce to goal of 20g/day fat then increase by 5-15g/week until lowest maintenance intake

TABLE 2 Outcomes of Interest

	Mansoor et al 2016 <sup>2</sup> (SR)	Bueno et al 2013 <sup>1</sup> (SR)	Gardner et al 2018 <sup>9</sup> (RCT)
<b>Mean Difference (95% Confidence Interval)</b>			
Weight Loss, kg	-2.17 (-3.36, -0.99)	-0.91 (-1.65, -0.17)	-0.70 (-0.21, 1.60)
HDL, mmol/L	0.14 (0.09, 0.19)	0.09 (0.06, 0.12)	0.06 (0.09, 0.03)
LDL, mmol/L	0.16 (0.003, 0.33)	0.12 (0.04, 0.2)	0.15 (0.24, 0.05)
Triglycerides, mmol/L	-0.26 (-0.37, -0.99)	-0.18 (-0.27, -0.08)	-0.47 (-0.20, -0.75)
Systolic Blood Pressure, mmHg	N/A	-1.47 (-3.44, 0.50)	-0.54 (-2.16, 1.07)
Diastolic Blood Pressure, mmHg	N/A	-1.43 (-2.49, -0.37)	-0.70 (-1.71, 0.31)
Fasting Blood Glucose, mmol/L	N/A	-0.08 (-0.18, 0.02)	0.04 (0, 0.09)
HbA1c, %	N/A	-0.24 (-0.55, 0.06)	N/A

### DISCUSSION

- Both systematic reviews<sup>1,2</sup> found statistically significant improved weight loss of up to 2kg with a ketogenic diet, compared to a low-fat diet.
- A concurrent 10-20% reduction in overall daily caloric intake was likely a factor in weight loss.
- While Gardner et al 2018<sup>9</sup> did not show significant weight loss, the low-carbohydrate group did not maintain a ketogenic diet but still achieved mean weight loss of 6 kg at 12-months.
- There were no clinically meaningful changes in HDL, LDL, triglycerides, blood pressure, nor glycemic control.
- No specific adverse effects were associated with a ketogenic diet.

### LIMITATIONS

- Studies and their results may not be comparable due to variable definitions of "ketogenic diet" within research literature and compared to popular literature.
- Dietary studies are difficult to ascertain adherence for longer durations of follow-up.