Background Discussions concerning weight-reducing diets are occupying an increasingly larger space in media, as the prevalence of overweight/obesity is increasing alongside the common interest in health. The often discussed low carbohydrate diets have successfully been used as treatment of epilepsy for a long time, setting a foundation for theories suggesting that low carbohydrate diets affecting brain function also possibly could affect the cognition.

Objective To examine how cognition is affected by a diet low in carbohydrates in obese adults.

Search strategy Pubmed, Scopus and snowballing. Keywords used in different combinations were low carbohydrate, atkins, carbohydrate restricted, south beach, ketogenic, lchf, zone, cognition, obese and obesity.

Selection criteria Solely human intervention or cohort studies in either English or Scandinavian languages were included. Intervention time was set as >1 week with ≤40g carbohydrates per day. It had to be obese adults 18-65 years old. Outcome measurements for examination were working memory and speed of processing.

Data collection and analysis Date for literature search 01-26-15. Title and abstract were read on each hit, articles irrelevant to the study question were excluded. To examine the quality of the studies SBUs "Mall för kvalitetsgranskning av randomiserade studier" was used both independently and together. The scientific basis for outcome measurements working memory and speed of processing was graded through "kapitel 10 – evidensgradering" in SBU’s handbook "Utvärdering av metoder i hälso- och sjukvården. En handbok." and "Underlag för sammanvägd bedömning enligt GRADE" produced by the University of Gothenburg.

Main results The quality of five intervention studies were reviewed, two of which were discovered to belong to the same study, this resulted in that four studies were given an assessment based on the risk of bias. These assessments were then translated into the study quality that was assigned each study. Only two of the studies kept a quality good enough to later be included in the merging and grading of evidence for the outcome measurements. The number of participants in the two merged studies were 21 and 107, respectively, and the intervention time was 4 and 52 weeks.

Conclusions There is very low (+) evidence that a low carbohydrate diet (<40 g/day) does not affect the cognitive working memory compared to control group in obese adults up to one year. There is very low (+) evidence that a low carbohydrate diet (<40 g/day) does affect the speed of processing negatively compared to control group in obese adults up to one year.