

Supplement B – Power Analyses

Analyses using GLIMMPSE, Kreidler, et al. [88] solved for power ($1-\beta$) specifying dependent variables of weight (kg) and HOMA-IR for Hotelling Lawley Trace Tests ($\alpha=0.05$). The design specified factors of Group (20% CER, 5:2D, and 5:2N) and Time (repeated measure, baseline and 24-weeks, correlation matrix=unstructured). The design included a cluster variable of site (Melbourne, Adelaide, estimated ICC=0.2, from Thompson, et al. [96], investigating clustering of diet behaviours). Equal group sizes were assumed and a scaling factor (ranging from 0.4 to 1.2 in increments of 0.1) was applied to the variability (standard deviation and serial correlation) to show the way in which the power and sample size change as a function of variability.

Weight (kg): Power calculations were conducted for a 3% (**Figure 3**) and a 5% (**Figure S1**) weight loss from baseline to 24-weeks. Standard deviations (SD) of weight were examined from weight loss studies [90] and shift workers [19 20]. To be conservative, we took the largest of the estimates from these studies [19]. For a 3% weight loss, scale = 1.0, 80% power would be reached at $n=64$ per group (total $n=192$). For scale =0.4, 80% power would be reached with $n=40$ per group (total $n=120$). For a 5% weight loss, 80% power is exceeded at a total sample size of $n=120$.

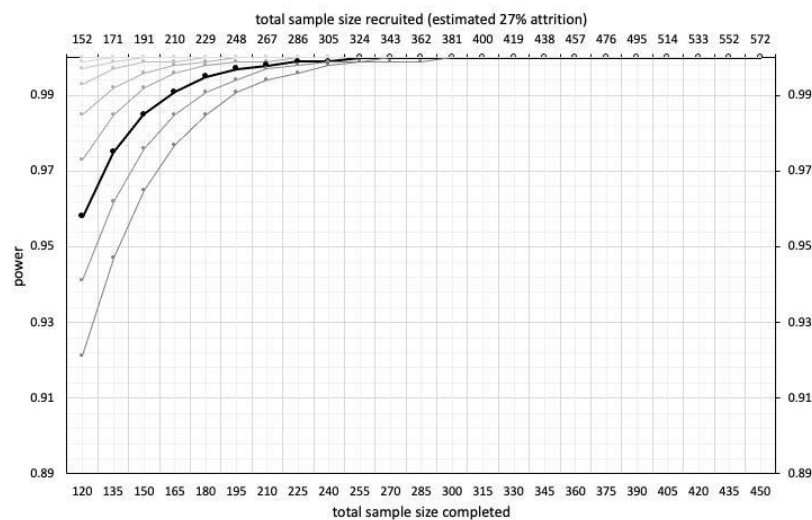


Figure S1. Power calculations for a 5% drop in weight. Power (y-axis) is displayed for increasing sample size (primary x-axis), with the 27% inflation applied (secondary x-axis) to account for attrition. Weight calculations represent predicted power to detect a 5% within-subjects change from baseline to 24 weeks across all groups (20% CER, 5:2D, and 5:2N). Multiple data series represent scaling applied to the variability estimates (0.4-1.2).

HOMA-IR: Power calculations were conducted for a Group*Time interaction effect, with means for 20% CER and 5:2D at baseline and 24-weeks estimated from Trepanowski, et al. [90]. We conservatively estimated 10% difference in change from baseline in the Day time and Night time fasting groups, based on Jakubowicz, et al. [21], who recorded a change that was nearly twice the size for

breakfast- rather than dinner-loaded meals (distributing energy to earlier, rather than later in the day). Standard deviations (SD) of weight were examined from weight loss studies [90] and shift workers[83 84]. To be conservative, we took the largest of the estimates from these studies (from Trepanowski, et al. [90] noting that this estimate was substantially larger than the estimates from the shift worker studies [83 84]). For scale = 1.0, 80% power would be reached at $n=79$ per group (total $n=237$). For scale =0.4, 80% power would be reached with $n=40$ per group (total $n=120$) (**Figure 3**).