**Question 1**

A study on the effect of maternal vitamin D supplementation on neonatal serum calcium was conducted. 164 breast feeding mums took part and 82 were randomly allocated to the supplement group and the remaining 82 were allocated to a placebo. 164 bottle feeding mums took part and 82 were randomly allocated to the supplement group and the remaining 82 were allocated to a placebo. Serum calcium concentrations (mmol/l) in one-week babies was recorded.

1(a) Produce a table providing summary statistics to compare the four groups. Produce at least one graphic to compare the four groups. Comment on what your table and graphic show.

1(b) Describe the structure of the study (independent variables, dependent variable) and detail why the researchers would have used random allocation.

1(c) For breast feeding mums only, compare serum calcium levels in the supplement group with the placebo group using the independent samples *t*-test. In reporting the results of your analysis give pertinent research hypotheses, statistical hypotheses, provide relevant output, justify the choice of statistical test, summarise your findings in a form suitable for publication and state any research conclusions that can be drawn.

1(d) Perform a two-way analysis on the data provided. What additional conclusions can be drawn from the two-way analysis?