Introducing the experimental design

The experimental design consists of 7 components

Scientific objective

Need operational definition for how data will be collected

Treatment

The experimental condition to which an experimental is subjected.

Experimental unit

Smallest portion of experimental material to be independently perturbed

Observational unit

The smallest unit on which a response is measured.

If one measurement is made on each rat: Observational unit = Experimental unit

replication –

biological replication

Each treatment is independently applied to each of several humans, animals or plants.

and technical replication

Several samples taken from the same biological source.

Advantageous if processing steps introduce a lot of variation.

Increases the precision with which comparisons of relative abundances between treatments are made.

Randomisation – Protects against bias

Introduces randomness to the experimental material

Blocking <- the main interest

Typically, the biologists would have acquired the required samples from the Phase 1 experiment before consulting for the design with the Phase 2 experiment with the statisticians.