# Research Planning and Methodology in Animal Welfare

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# 1 Research Planning and Methodology in Animal Welfare

## 1.1 Preface

This book accompanies the Research Planning and Methodology in Animal Welfare course on the International Animal Welfare Ethics and Law MSc at the Royal (Dick) School of Veterinary Studies.

It is a companion document to the course

# 2 Week 1

## 2.1 Lecture 5

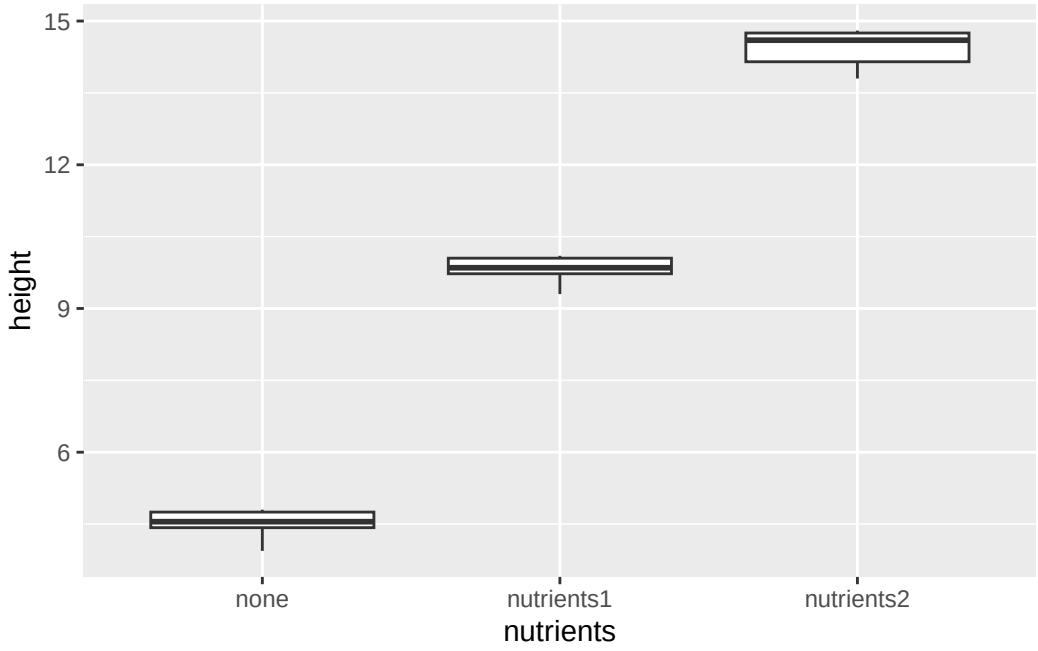
This code will help you recreate the charts and analyses in Lecture 5: "Introduction to Research Methods"

### 2.1.1 Create data and plot

```
library(tidyverse)

plants <- tibble(none = c(4.8, 4.8, 3.94, 4.4,4.5,4.6),
                 nutrients1  = c( 10.1, 9.7, 9.8, 9.9, 9.3, 10.1),
                 nutrients2 = c(14.8, 14.6, 14.8, 14, 13.8, 14.6))

plants |>
  pivot_longer(cols = c(none, nutrients1,nutrients2),
               names_to = "nutrients",
               values_to = "height") |>
  ggplot(aes(x = nutrients, y = height)) +
  geom_boxplot()
```




### 2.1.2 Run an ANOVA on Plant data

```
longplants <- plants |>
  pivot_longer(cols = c(none, nutrients1,nutrients2),
                             names_to = "nutrients",
                             values_to = "height")

plant_model <- aov(height ~ nutrients, data = longplants)

summary(plant_model)
```

```
            Df Sum Sq Mean Sq F value Pr(>F)
nutrients    2 296.10  148.05    1184 <2e-16 ***
Residuals   15   1.88    0.13
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

### 2.1.3 Read and Run Crude Chicken Correlations

```
crudechicks <- tibble(year = c("2000", "2001", "2002", "2003",
                               "2004", "2005", "2006", "2007",
                               "2008", "2009"),
                      chicken = c(54.2, 54, 56.8, 57.5, 59.3, 60.5, 60.9,
                                  59.9, 58.7, 56),
                      crude = c(3311, 3405, 3336, 3521, 3674, 3670, 3685,
                                3656, 3571, 3307))


cor.test(crudechicks$chicken, crudechicks$crude, method = "spearman")
```

```
    Spearman's rank correlation rho

data:  crudechicks$chicken and crudechicks$crude
S = 20, p-value = 0.001977
alternative hypothesis: true rho is not equal to 0
sample estimates:
      rho
0.8787879
```