# Análise Doutorado Débora

## Biorigin

### Carregando pacotes

library(tidyverse)  
library(ExpDes.pt)  
library(lme4)  
library(agricolae)  
library(readxl)  
library(janitor)  
library(MASS)  
library(car)

### Entrada de dados

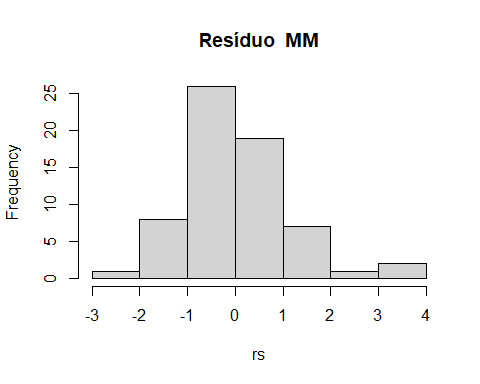
## Lendo os dados  
dados <- read\_xlsx("data/dados\_01.xlsx",  
 sheet = "Análises Fezes") %>%   
 clean\_names() %>%   
 mutate(  
 dose = case\_when(  
 tr == 1 ~ 0,  
 tr == 2 | tr == 5 ~ 0.2,  
 tr == 3 | tr == 6 ~ 0.4,  
 tr == 4 | tr == 7 ~ 0.8  
 ),  
 ingrediente = ifelse(tr==1,"PCL",  
 ifelse(tr > 1 & tr<=4 ,"PCL","PCLs")),  
   
 # transformação dos dados  
 mo = log(mo),  
 fibra\_in = log(fibra\_in),  
 ee\_in = log(ee\_in),  
 amido\_in = log(amido\_in),  
 ph=ph^(-2),  
 am=am^2  
 )  
  
#extraindo o controle  
da <- dados %>% filter(dose==0) %>%   
 mutate(  
 ingrediente="PCLs"  
 )  
  
#duplicando o controle  
dados <- rbind(dados,da)

### Vislumbre

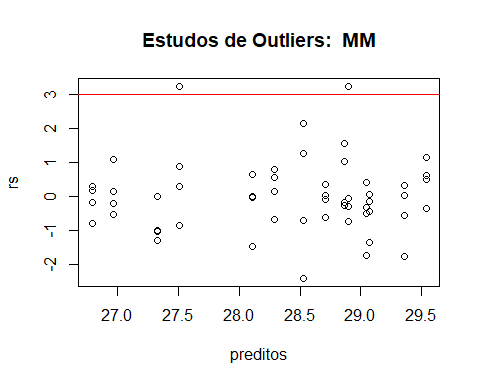
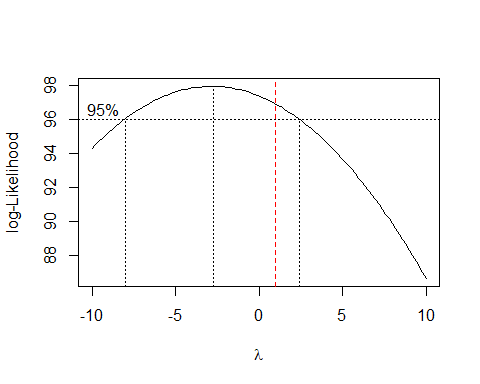
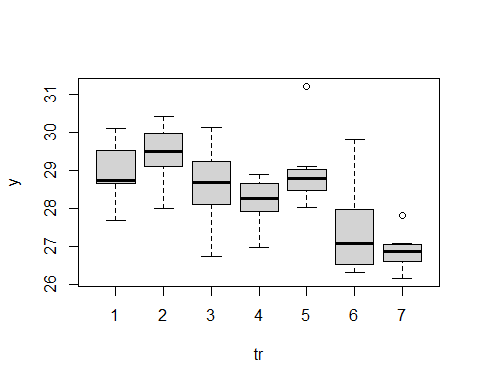
# glimpse(dados)

## Normalidade de Homocedasticidade

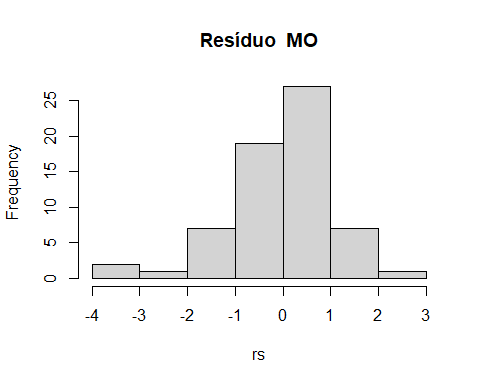
variaveis <- dados %>%   
 dplyr::select(mm:tripta\_mg\_100,-score)  
  
for(i in seq\_along(variaveis)){  
 nome <- names(variaveis[i])  
 print("====================================")  
 print(str\_to\_upper(nome))  
 print("====================================")  
  
 daux <- variaveis[i]  
 names(daux) <- "y" ### <-  
 y <- daux$y ### <-  
 bl <- dados$bl %>% as\_factor()  
 tr <- dados$tr %>% as\_factor()  
  
 mod <- aov(y ~ tr + bl)  
 rs <- mod %>% rstudent()  
 hist(rs, main = paste("Resíduo ", str\_to\_upper(nome)) )  
  
 print(shapiro.test(rs))  
  
 plot(y ~ tr)  
 filtro <- y != 0  
 mod\_box <- aov(y[filtro] ~ tr[filtro] + bl[filtro])  
 boxcox(mod\_box,seq(-10,10,.5))  
 abline(v=1,col="red",lty=2)  
   
 preditos <- predict(mod)  
 plot(preditos,rs,  
 main=paste("Estudos de Outliers: ", str\_to\_upper(nome)))  
 abline(h=c(3,-3),col="red")  
 cat("\n")  
}  
#> [1] "===================================="  
#> [1] "MM"  
#> [1] "===================================="



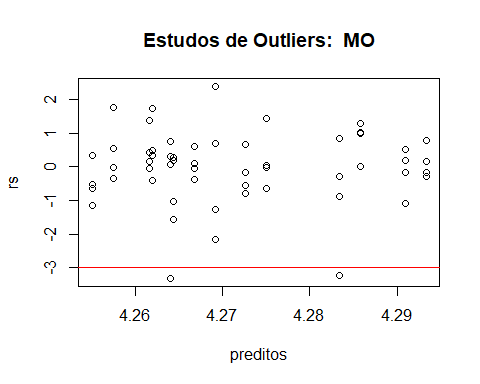
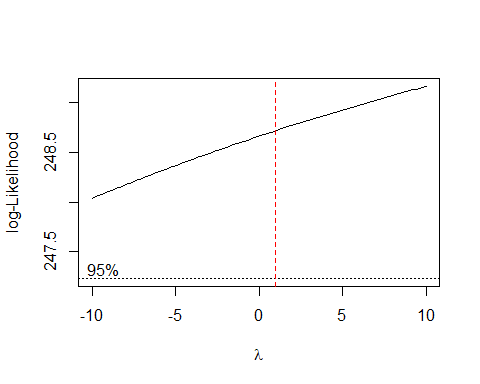
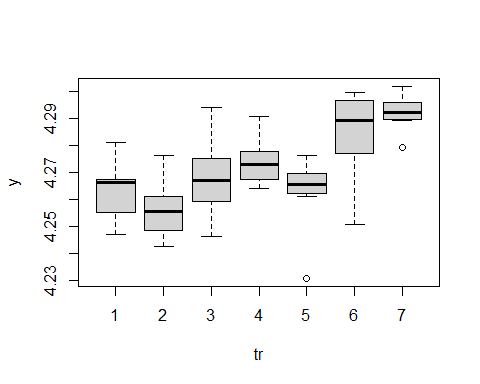
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.95277, p-value = 0.0157



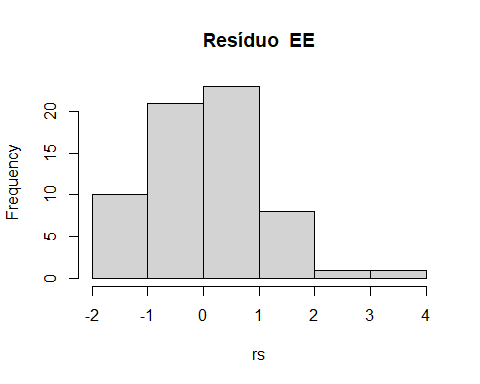
#>   
#> [1] "===================================="  
#> [1] "MO"  
#> [1] "===================================="



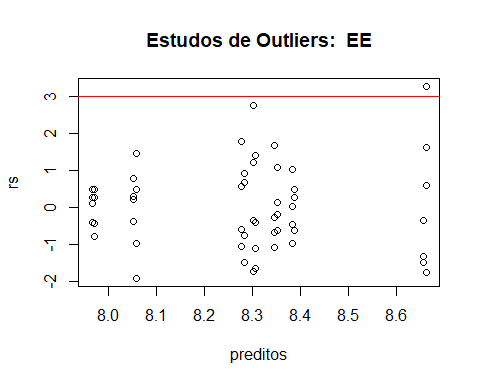
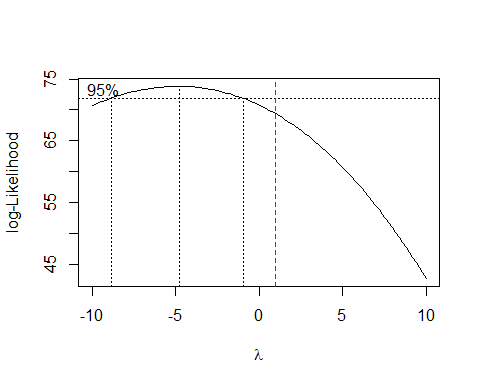
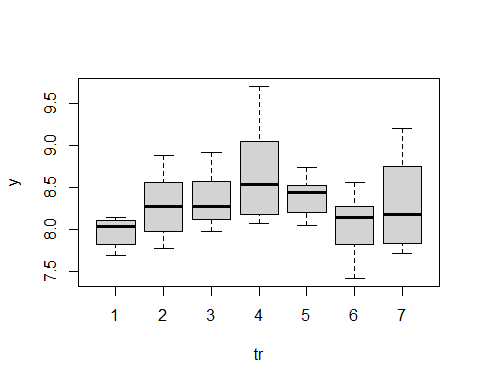
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.95132, p-value = 0.01329



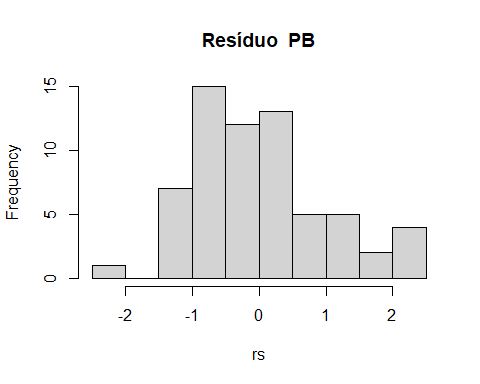
#>   
#> [1] "===================================="  
#> [1] "EE"  
#> [1] "===================================="



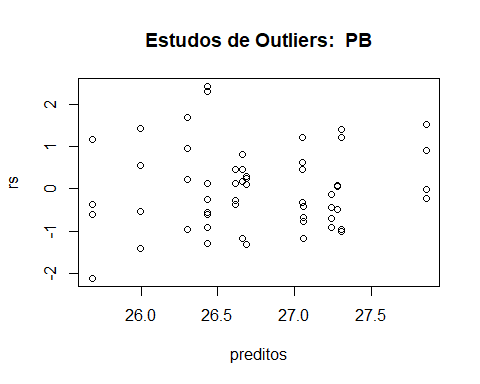
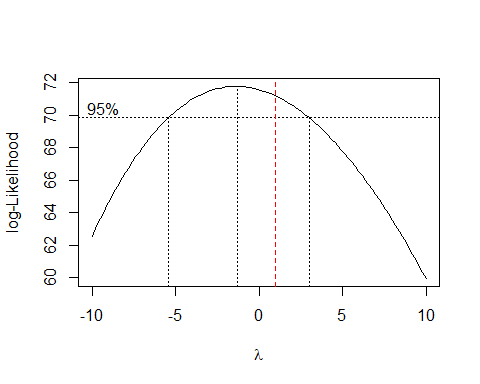
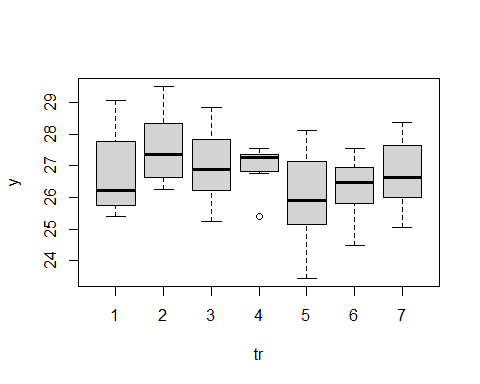
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96971, p-value = 0.1169



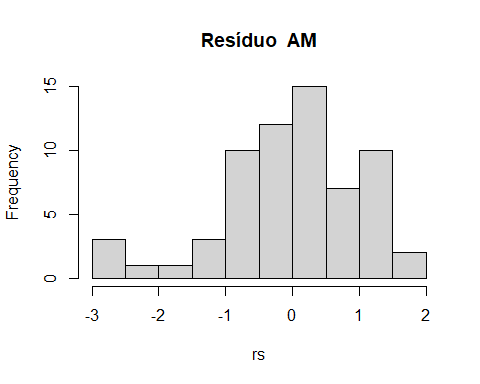
#>   
#> [1] "===================================="  
#> [1] "PB"  
#> [1] "===================================="



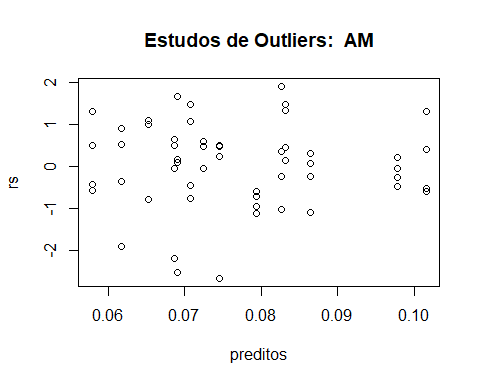
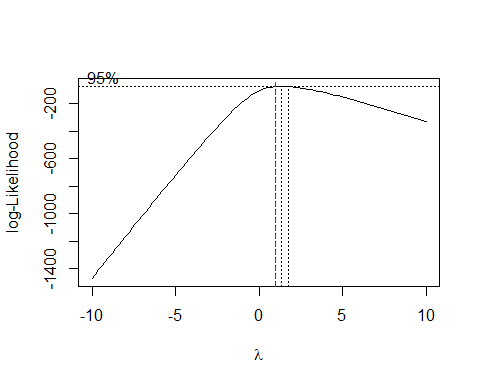
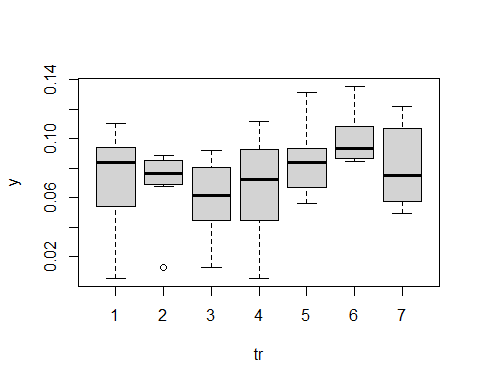
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.95028, p-value = 0.01181



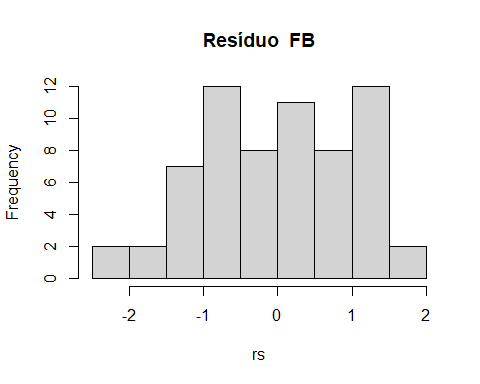
#>   
#> [1] "===================================="  
#> [1] "AM"  
#> [1] "===================================="



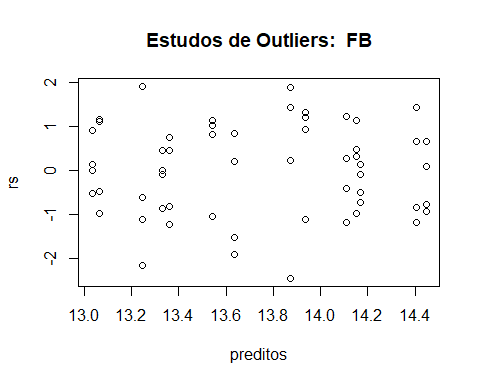
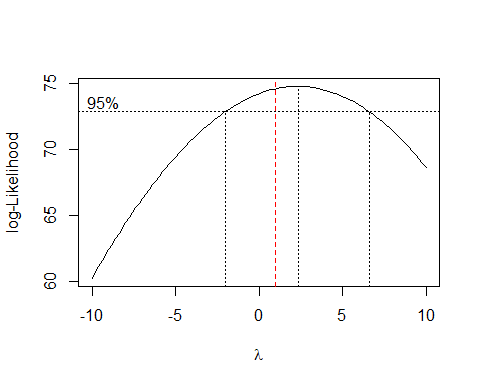
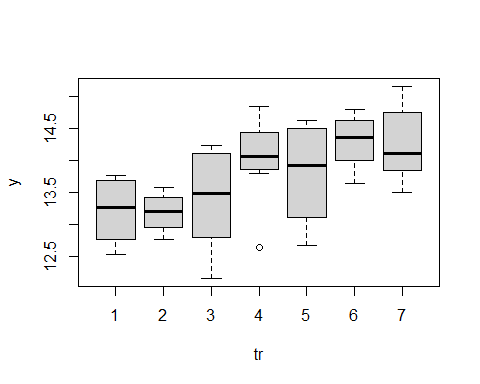
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.95525, p-value = 0.02091



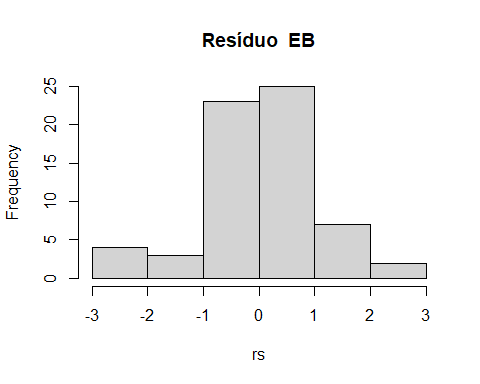
#>   
#> [1] "===================================="  
#> [1] "FB"  
#> [1] "===================================="



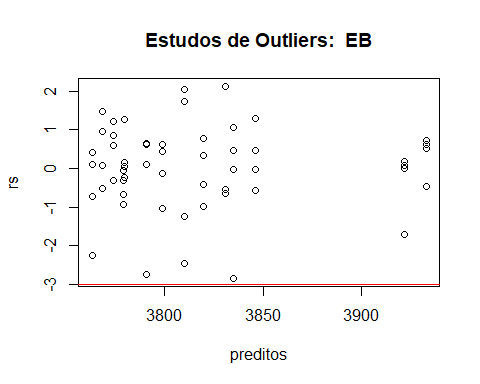
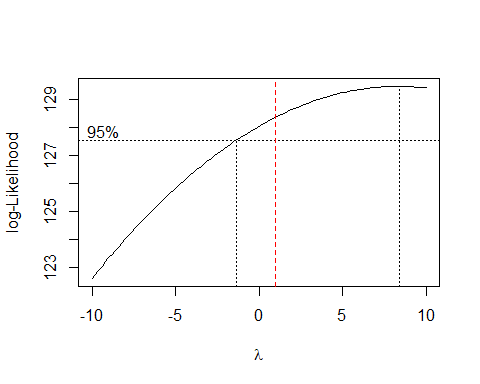
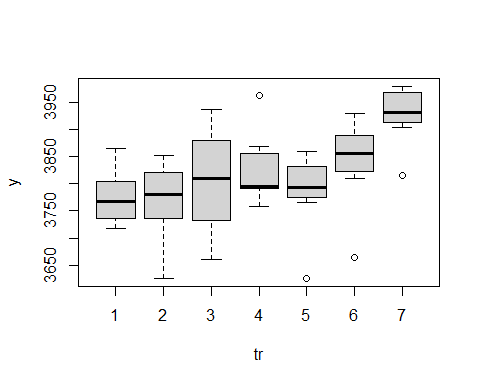
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96898, p-value = 0.107



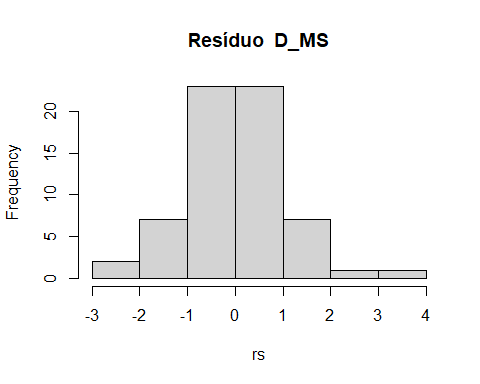
#>   
#> [1] "===================================="  
#> [1] "EB"  
#> [1] "===================================="



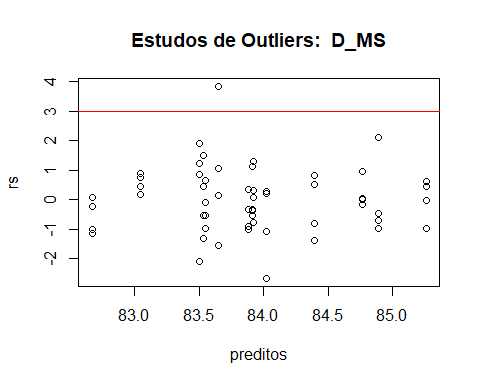
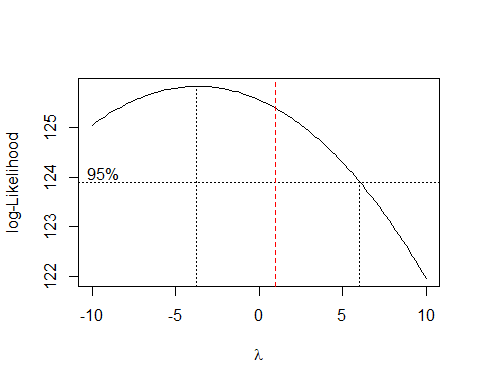
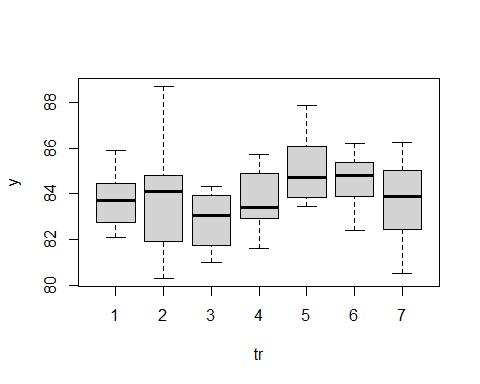
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96403, p-value = 0.05902



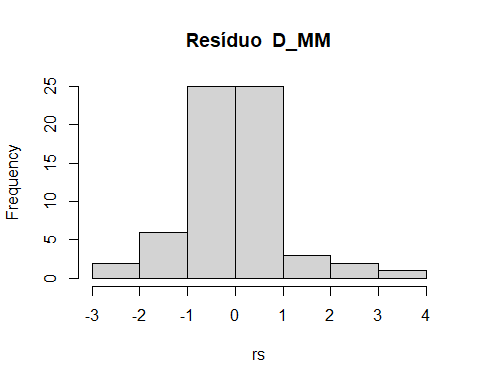
#>   
#> [1] "===================================="  
#> [1] "D\_MS"  
#> [1] "===================================="



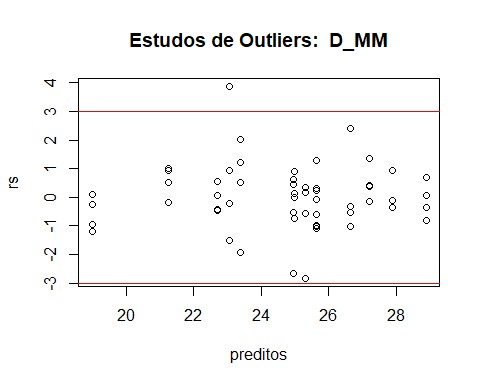
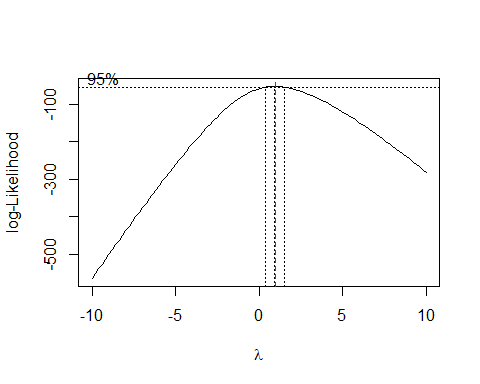
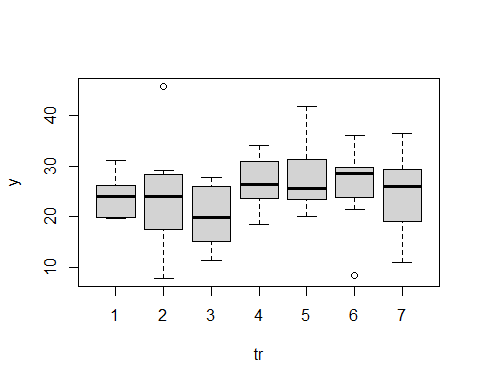
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96972, p-value = 0.1169



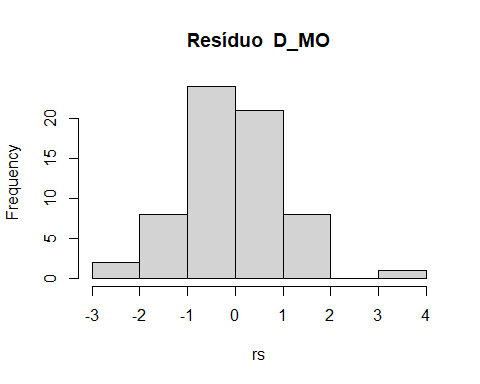
#>   
#> [1] "===================================="  
#> [1] "D\_MM"  
#> [1] "===================================="



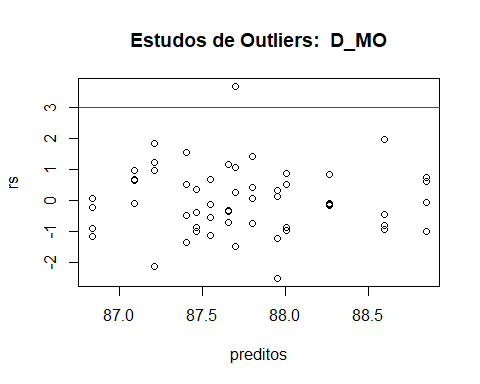
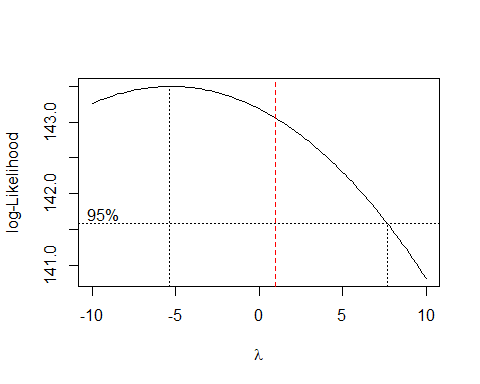
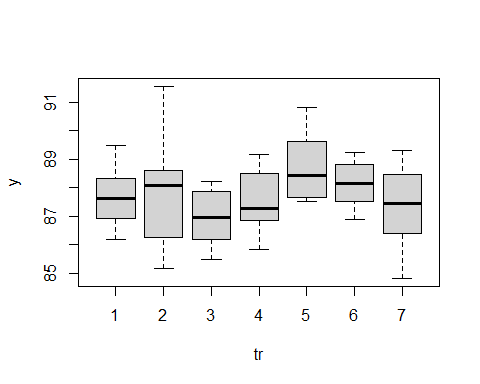
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.94957, p-value = 0.0109



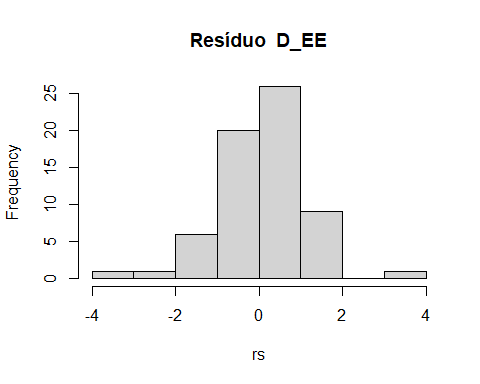
#>   
#> [1] "===================================="  
#> [1] "D\_MO"  
#> [1] "===================================="



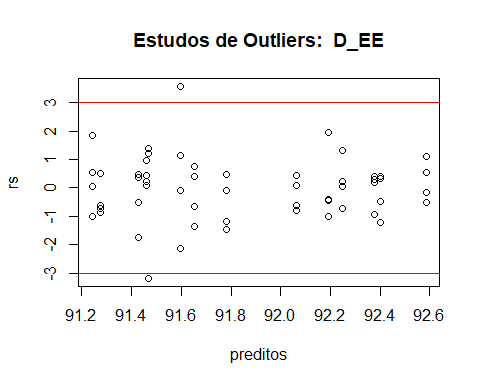
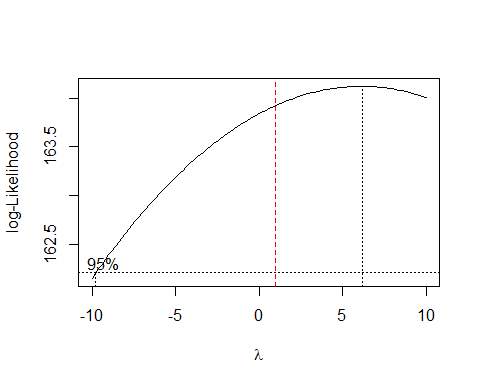
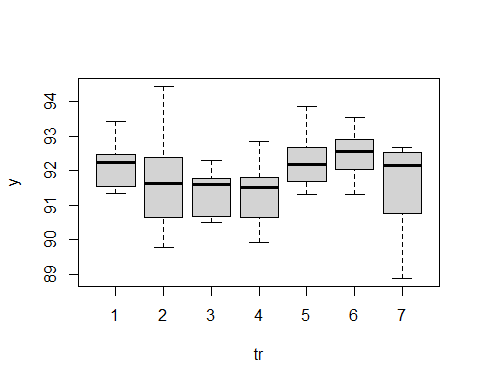
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.97563, p-value = 0.2356



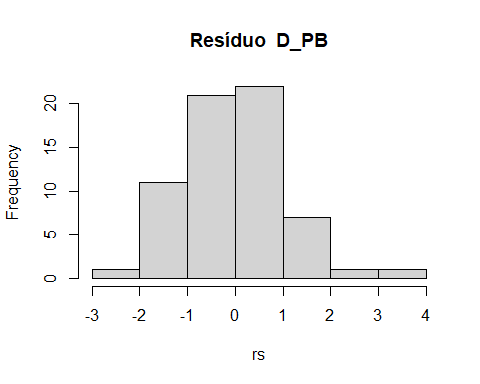
#>   
#> [1] "===================================="  
#> [1] "D\_EE"  
#> [1] "===================================="



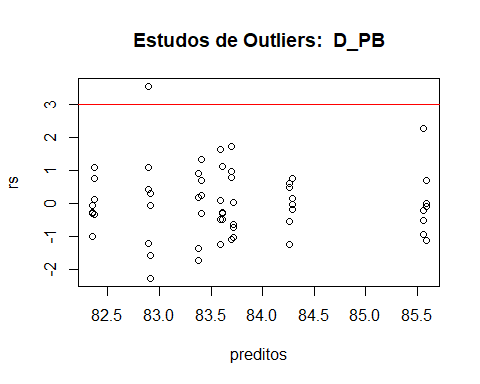
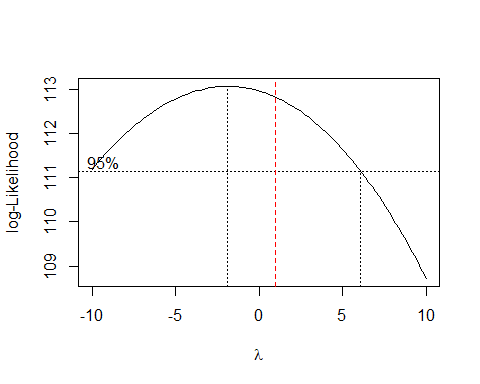
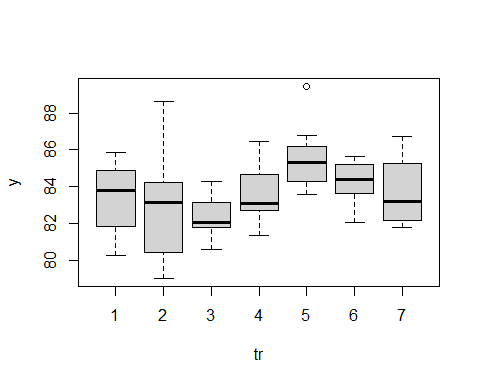
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.968, p-value = 0.09512



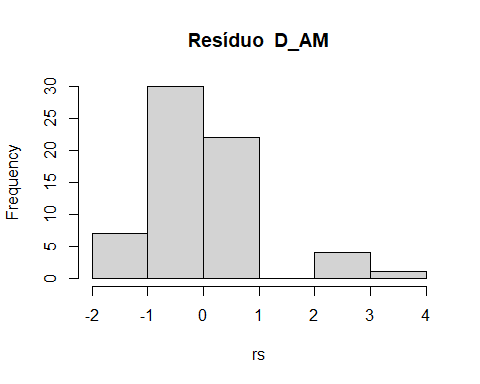
#>   
#> [1] "===================================="  
#> [1] "D\_PB"  
#> [1] "===================================="



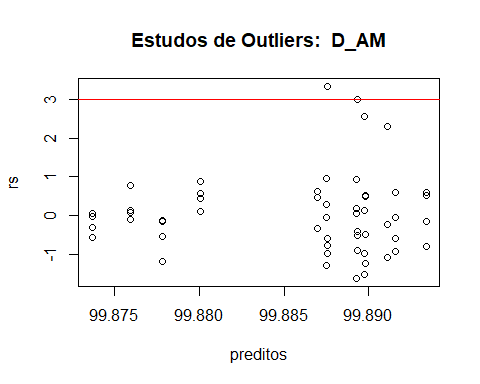
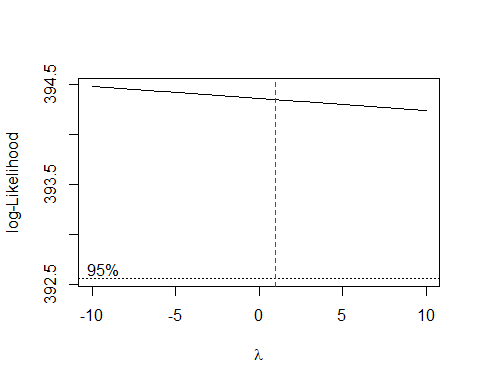
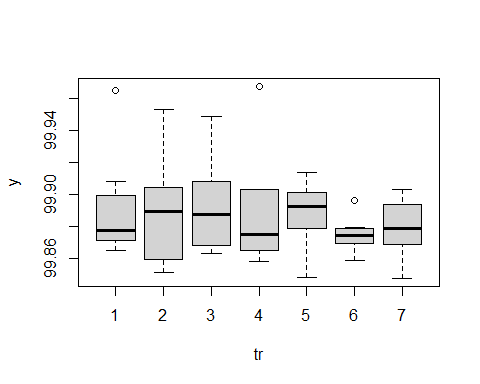
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.97742, p-value = 0.2892



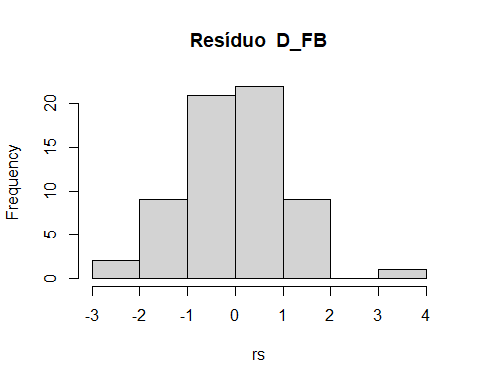
#>   
#> [1] "===================================="  
#> [1] "D\_AM"  
#> [1] "===================================="



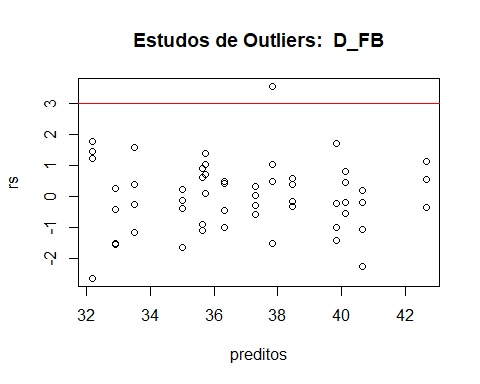
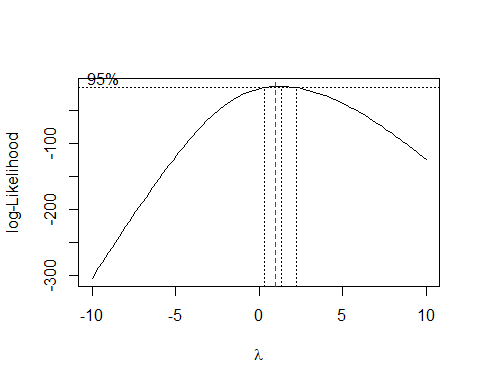
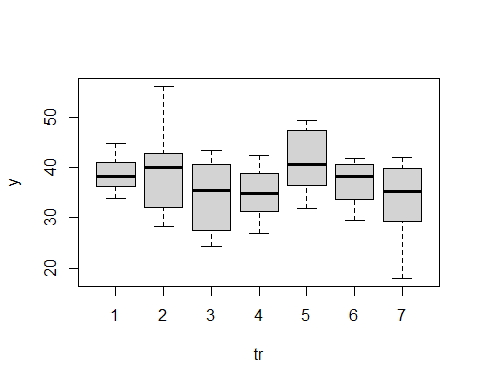
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.87891, p-value = 1.401e-05



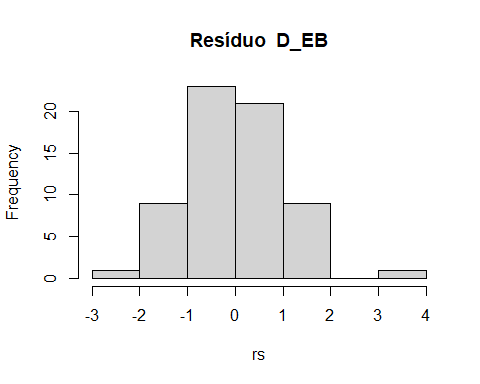
#>   
#> [1] "===================================="  
#> [1] "D\_FB"  
#> [1] "===================================="



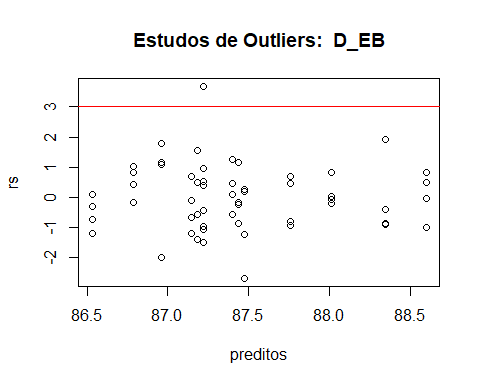
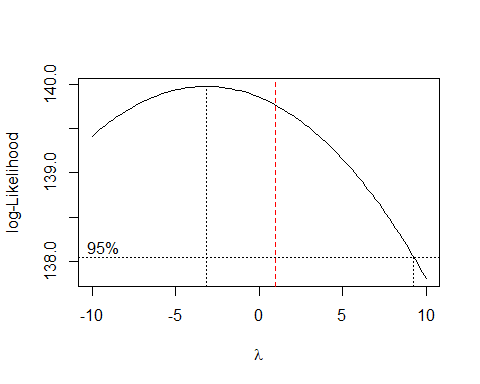
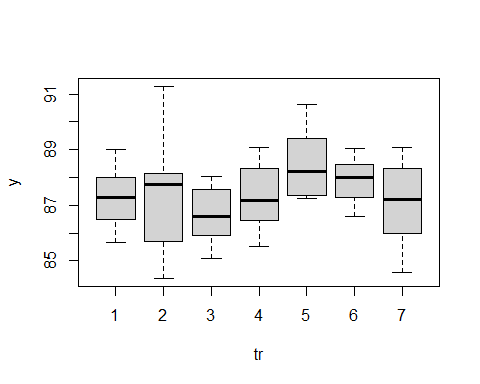
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.9782, p-value = 0.3157



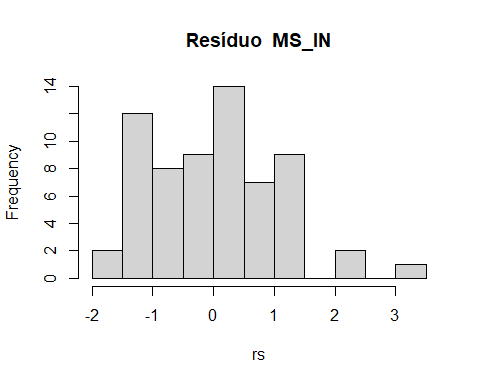
#>   
#> [1] "===================================="  
#> [1] "D\_EB"  
#> [1] "===================================="



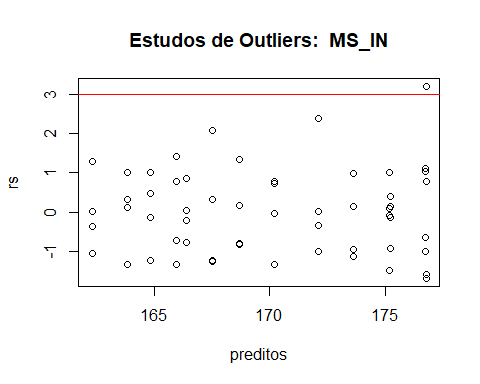
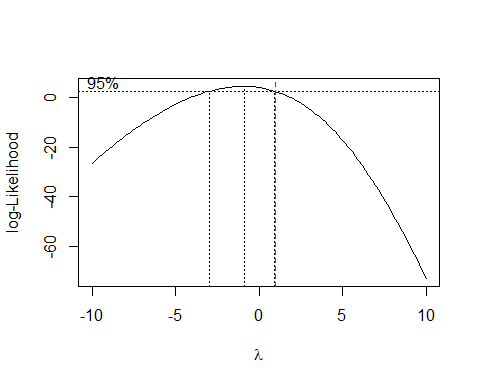
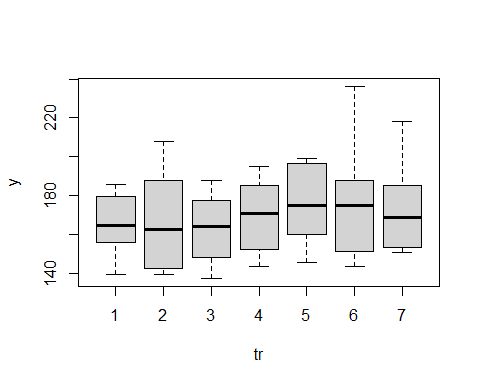
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.97609, p-value = 0.2484



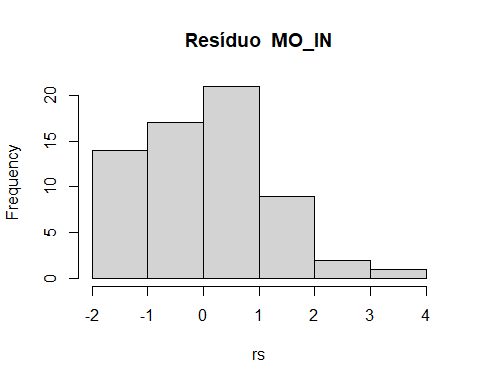
#>   
#> [1] "===================================="  
#> [1] "MS\_IN"  
#> [1] "===================================="



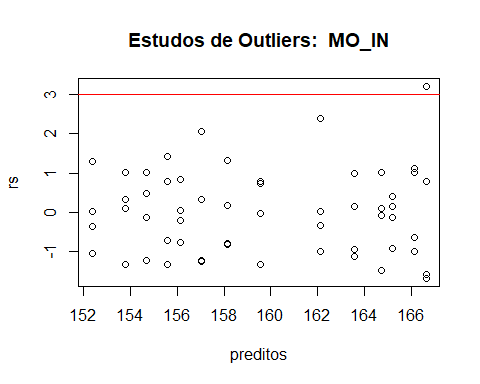
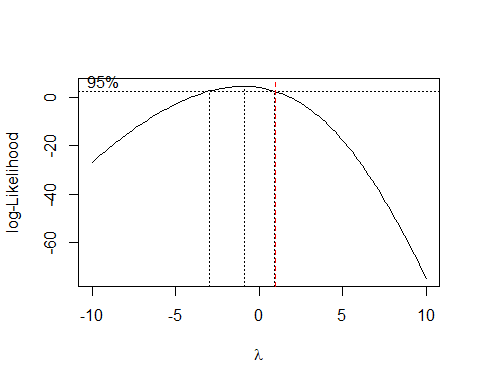
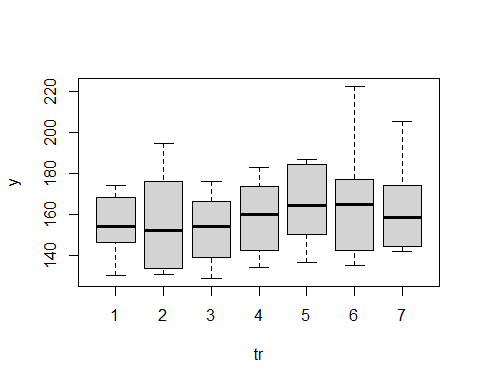
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96103, p-value = 0.04127



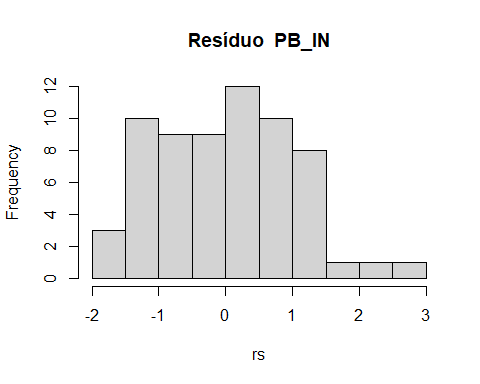
#>   
#> [1] "===================================="  
#> [1] "MO\_IN"  
#> [1] "===================================="



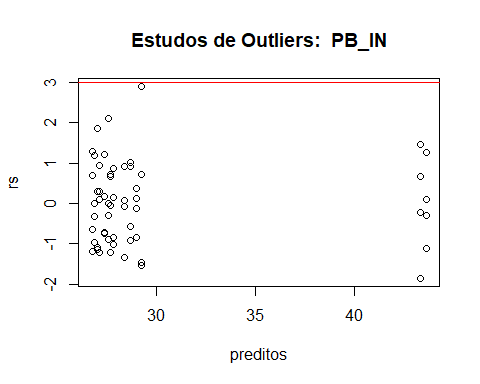
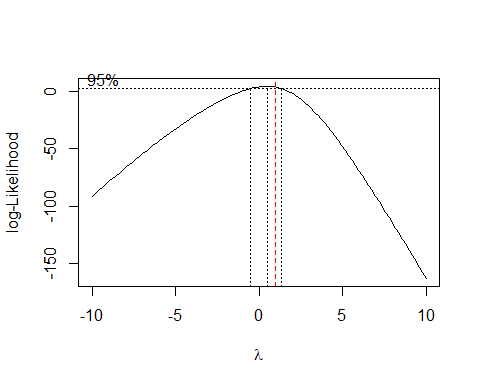
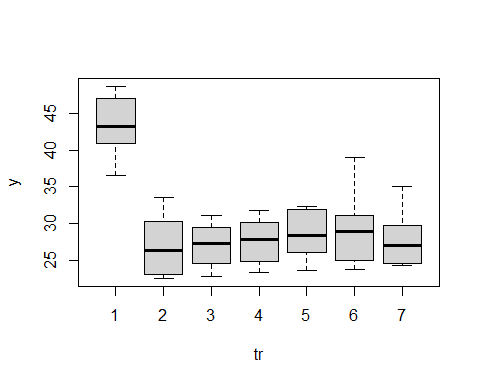
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96099, p-value = 0.04106



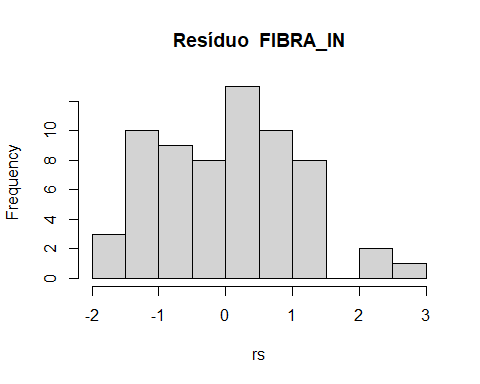
#>   
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#> [1] "===================================="



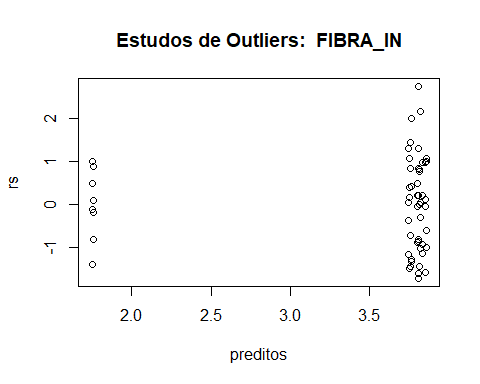
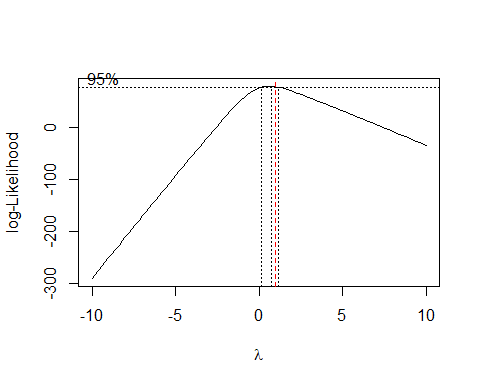
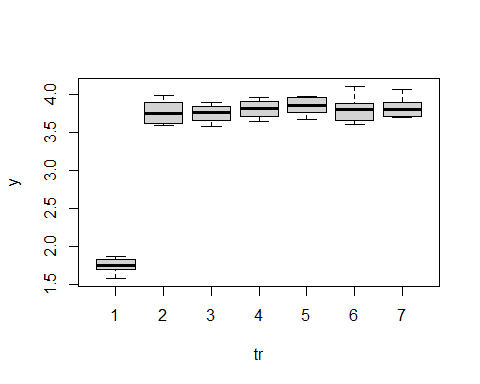
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.9785, p-value = 0.3266



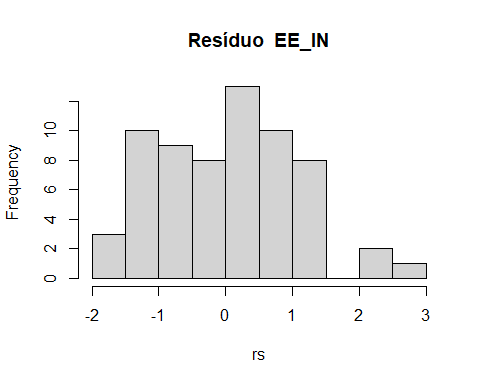
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#> [1] "FIBRA\_IN"  
#> [1] "===================================="



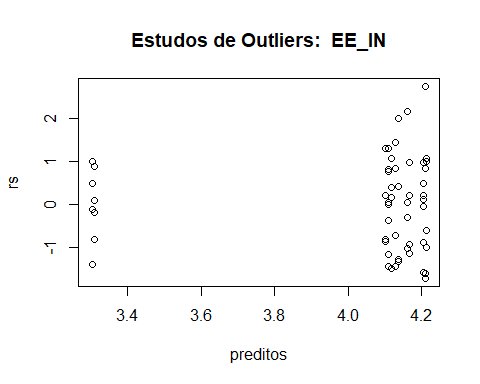
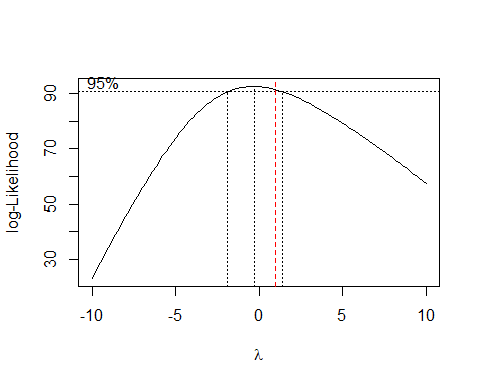
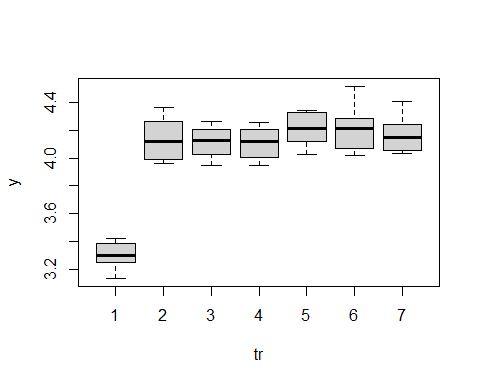
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96785, p-value = 0.09346



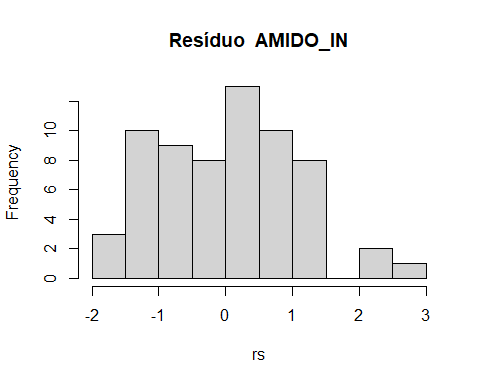
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#> [1] "EE\_IN"  
#> [1] "===================================="



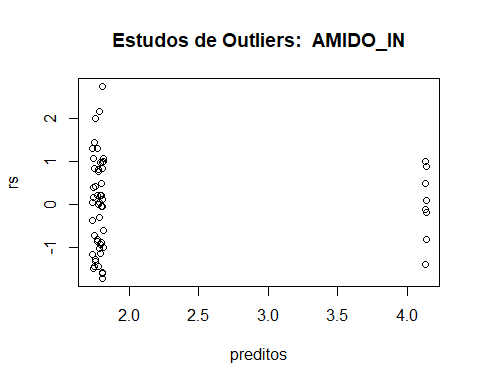
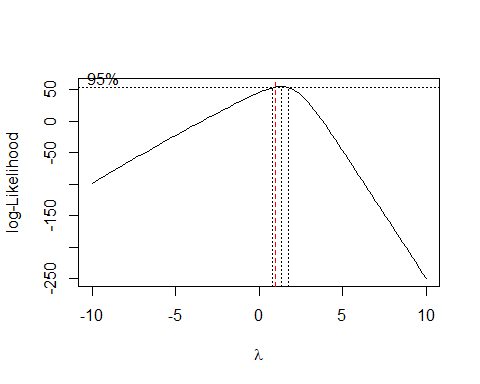
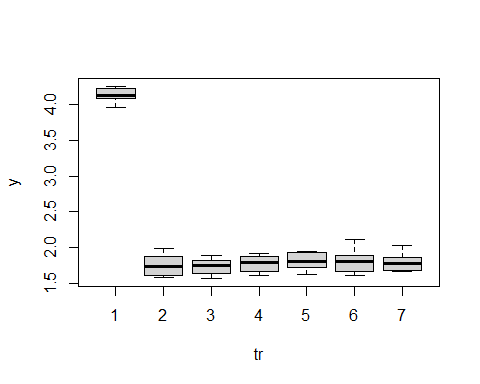
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96785, p-value = 0.09346



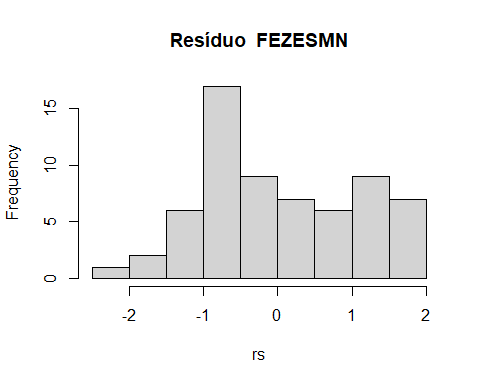
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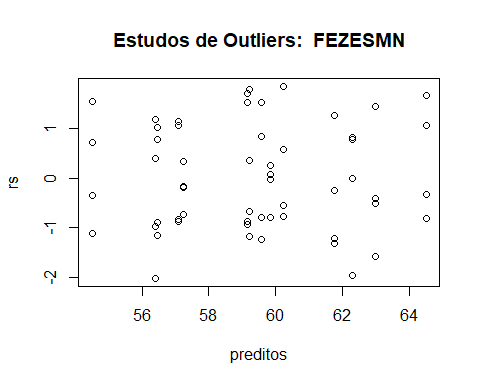
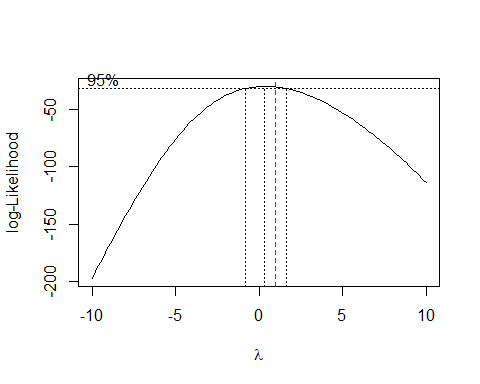
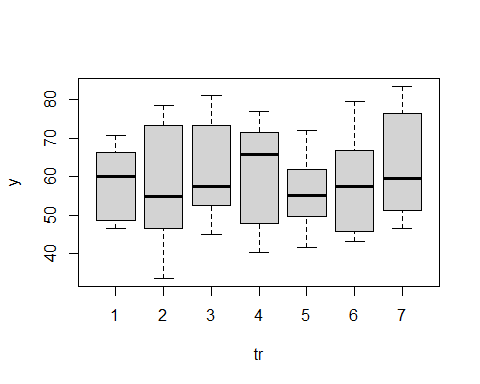
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96785, p-value = 0.09346



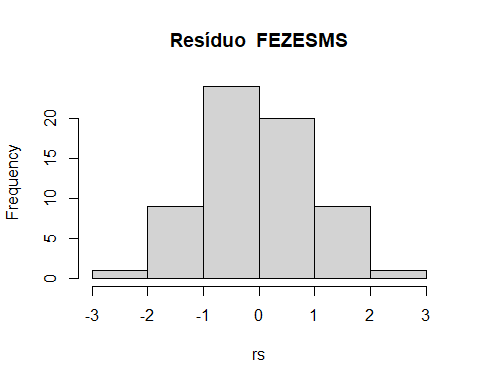
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#> [1] "===================================="



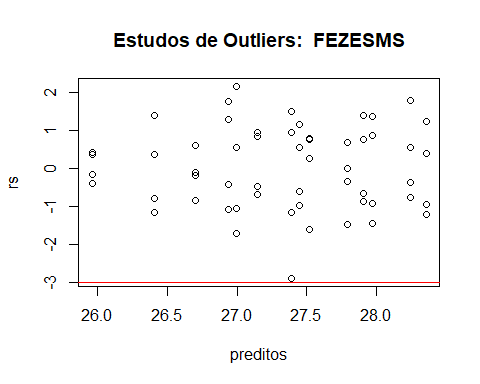
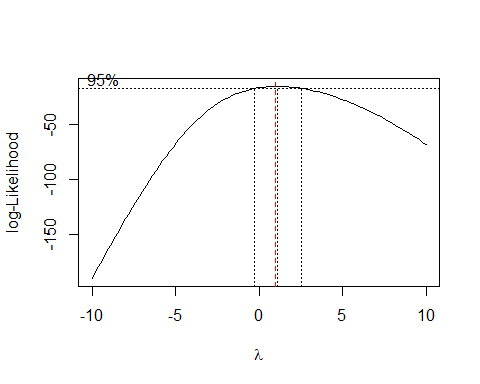
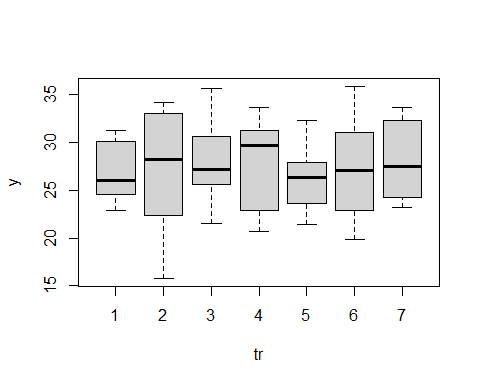
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.95491, p-value = 0.02011



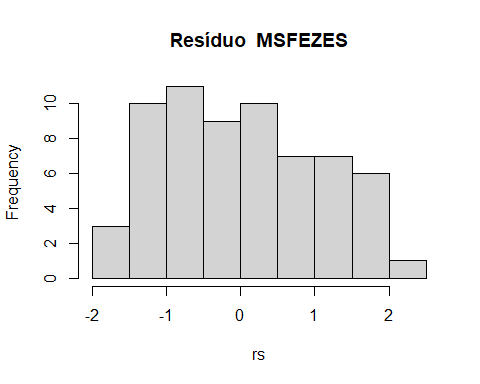
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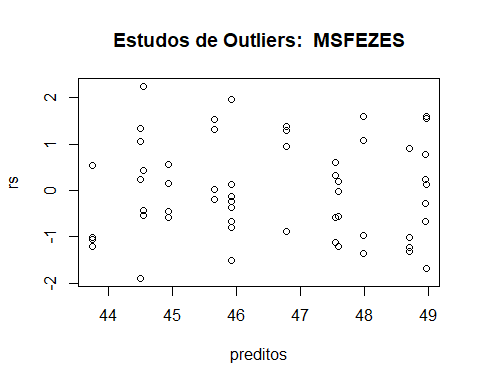
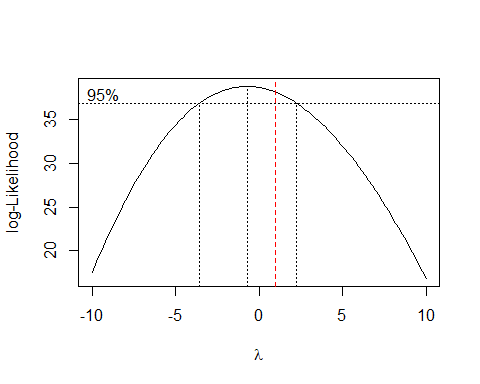
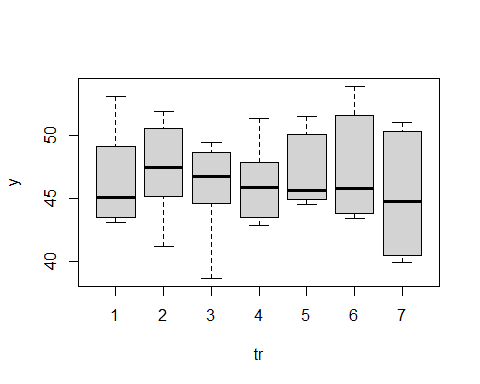
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.97881, p-value = 0.3381



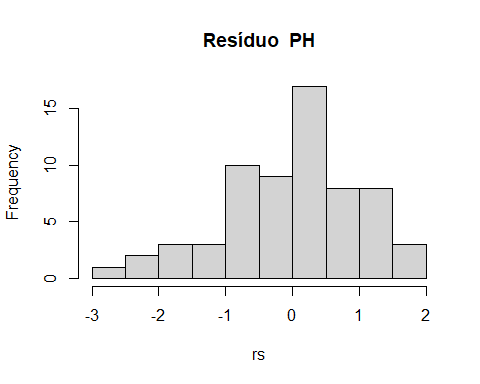
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#> [1] "===================================="



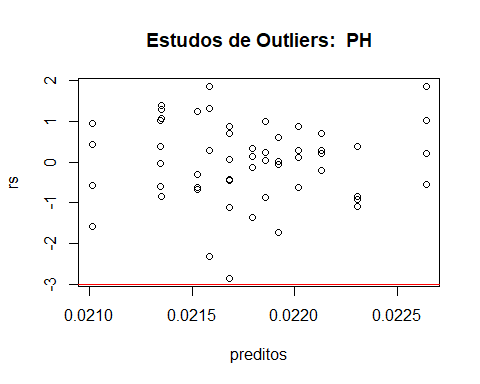
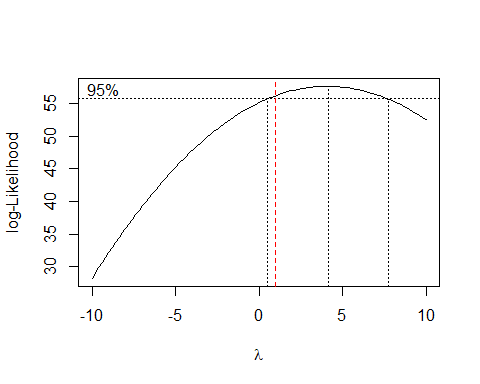
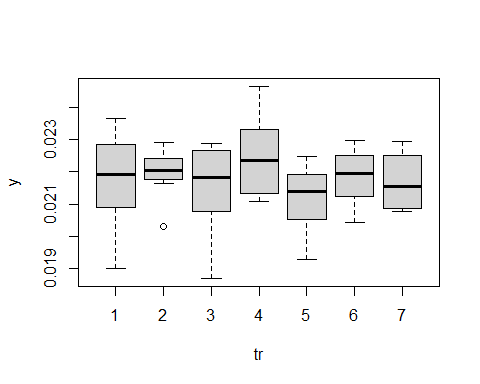
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96968, p-value = 0.1164



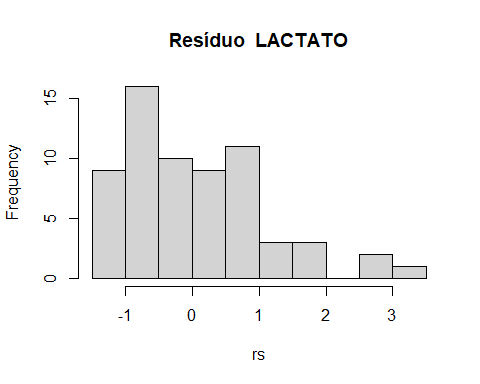
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#> [1] "===================================="



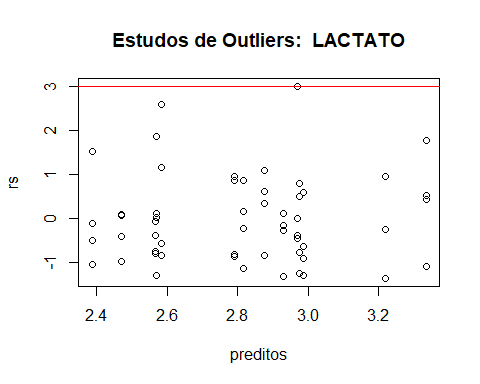
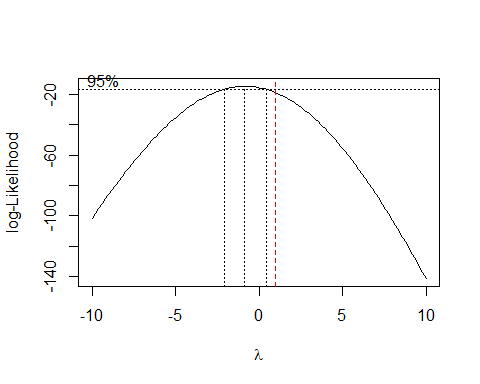
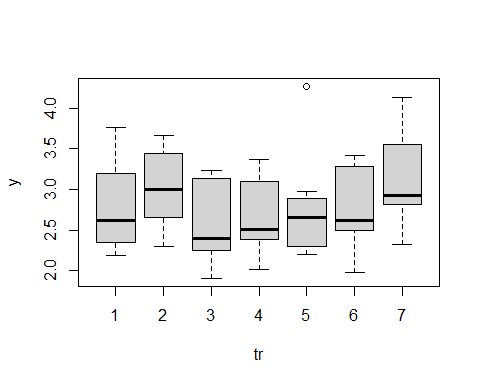
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.97492, p-value = 0.217



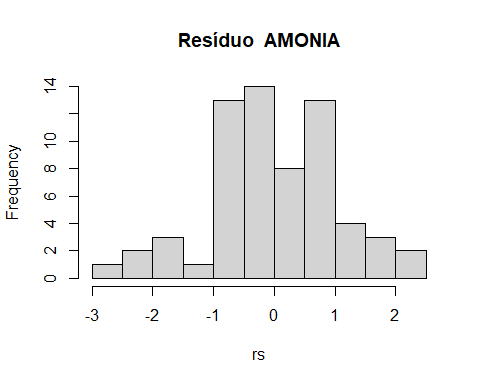
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#> [1] "===================================="



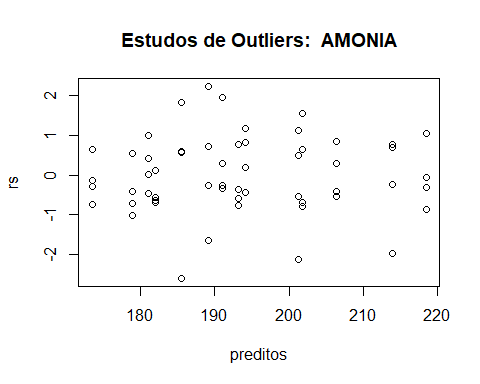
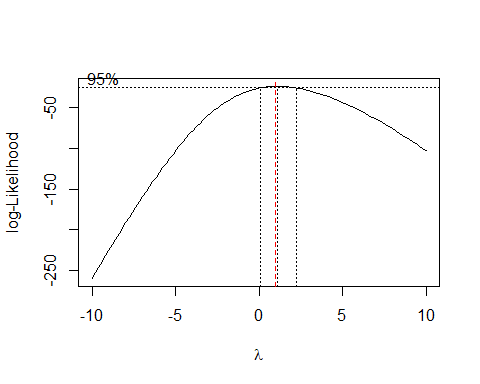
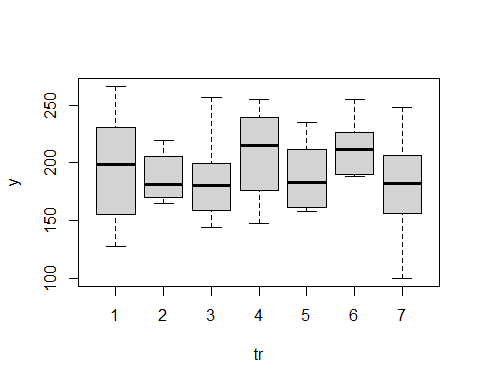
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.92831, p-value = 0.001126



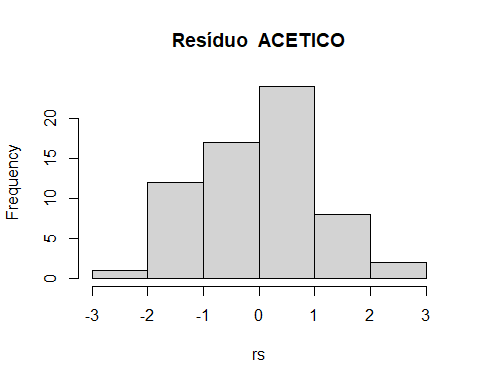
#>   
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#> [1] "===================================="



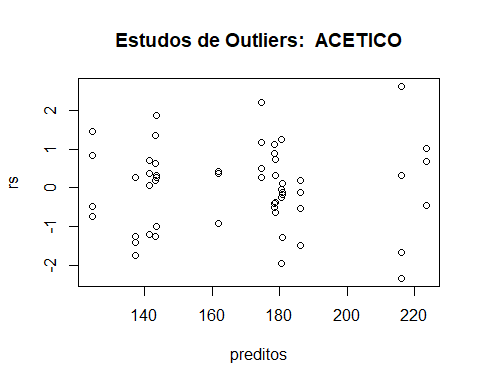
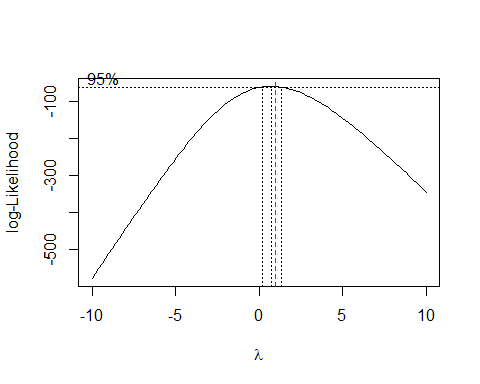
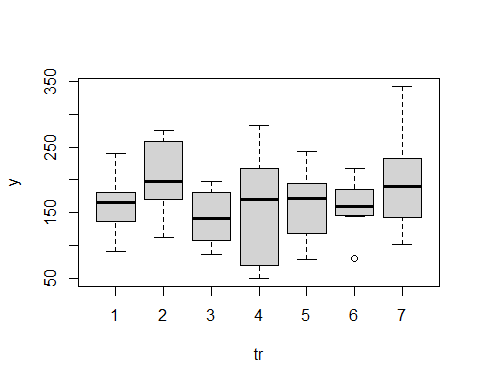
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.9752, p-value = 0.2242



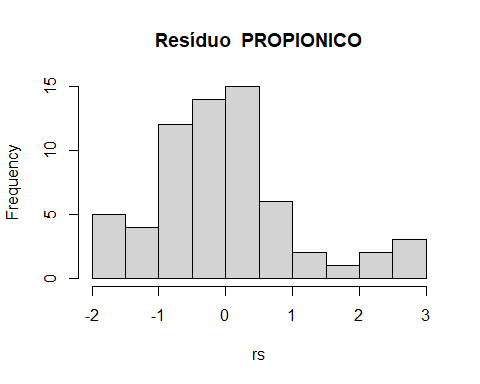
#>   
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#> [1] "===================================="



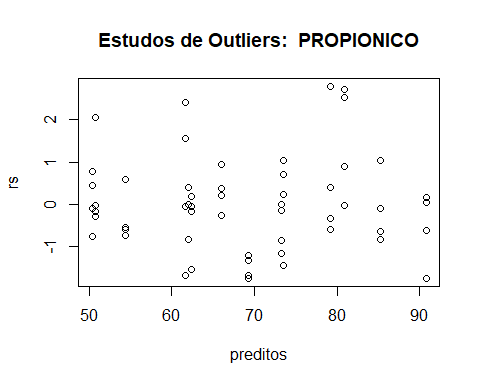
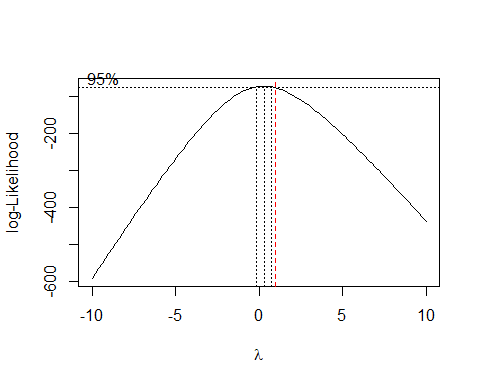
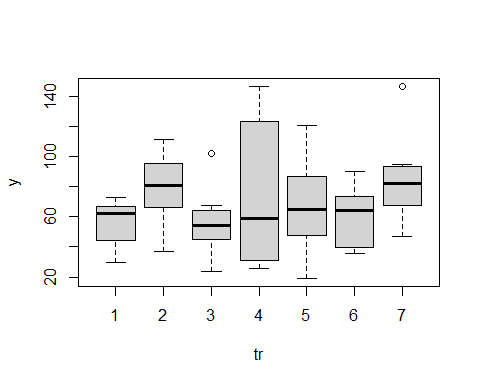
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.98983, p-value = 0.8792



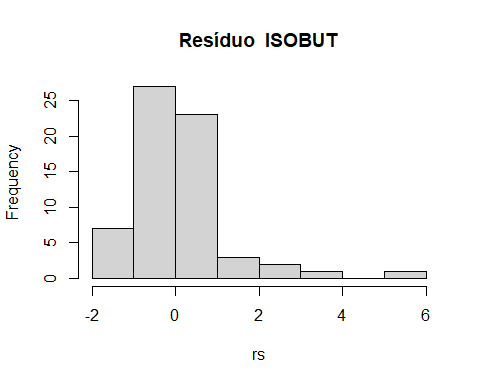
#>   
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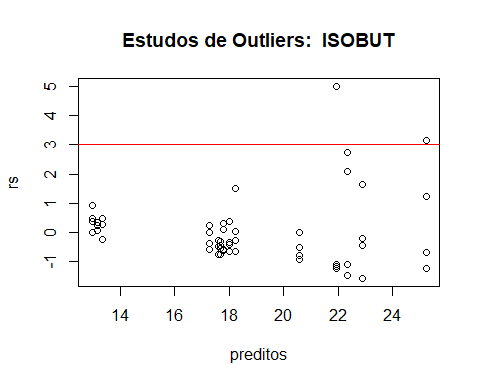
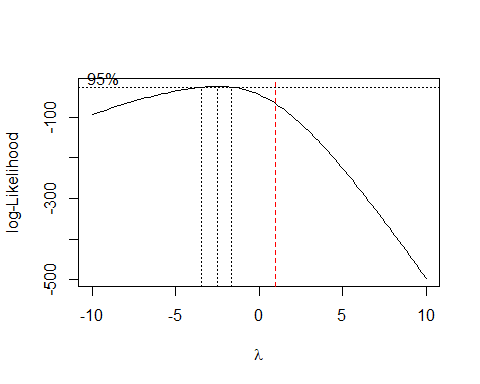
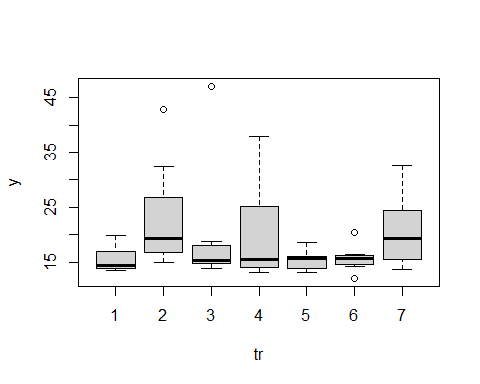
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.94001, p-value = 0.0038



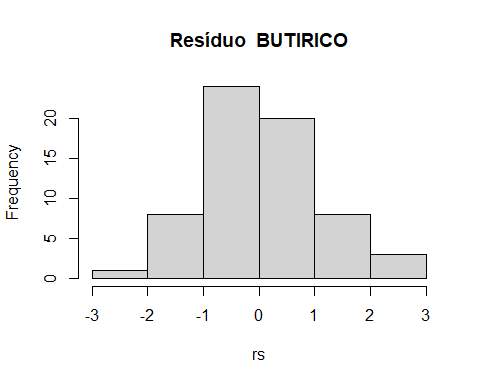
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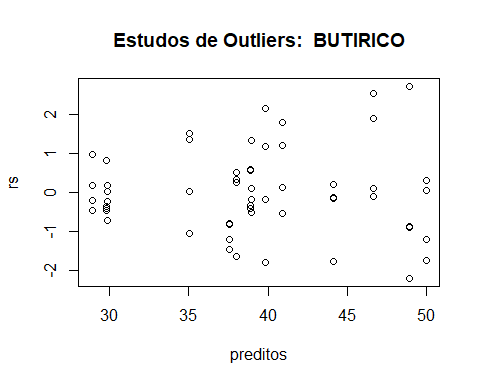
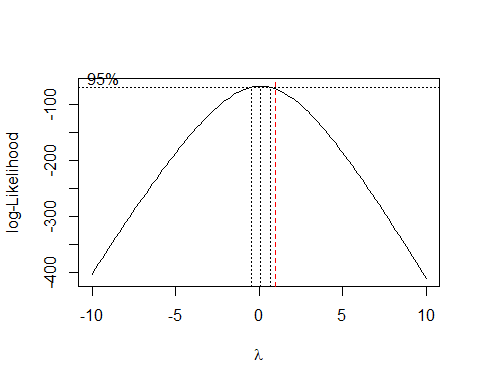
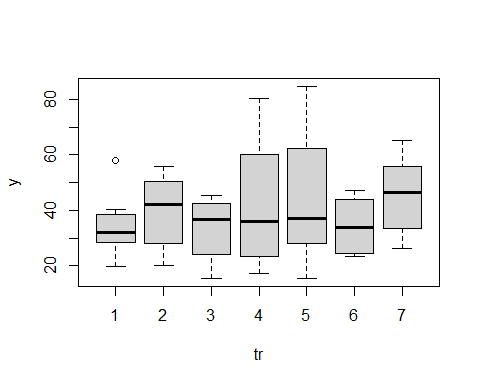
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.81438, p-value = 1.584e-07



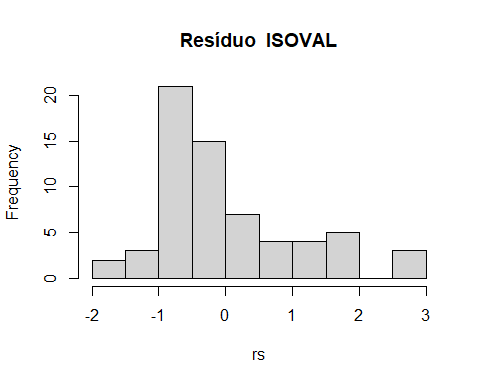
#>   
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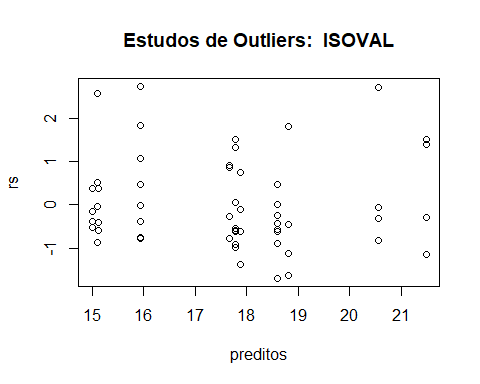
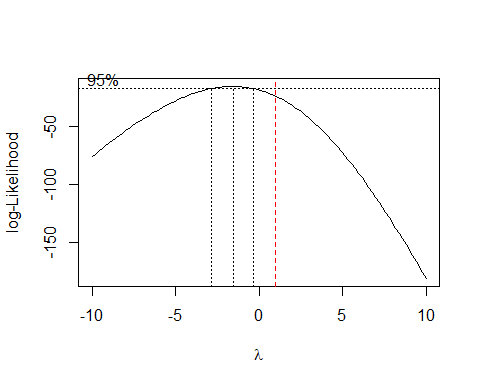
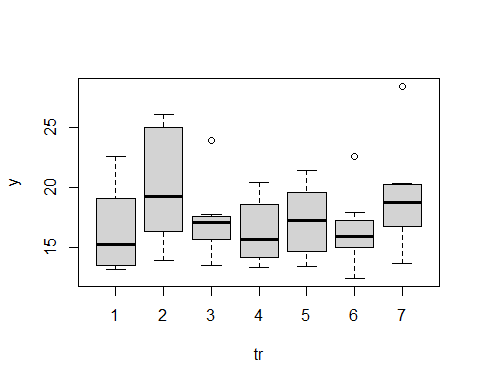
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96947, p-value = 0.1136



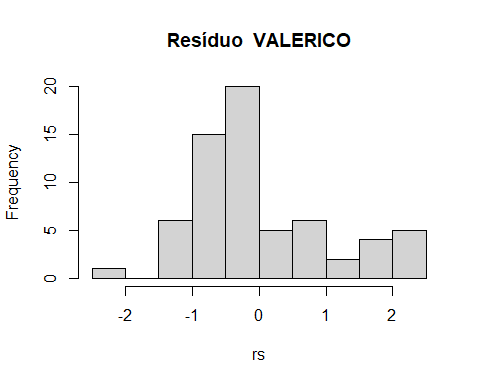
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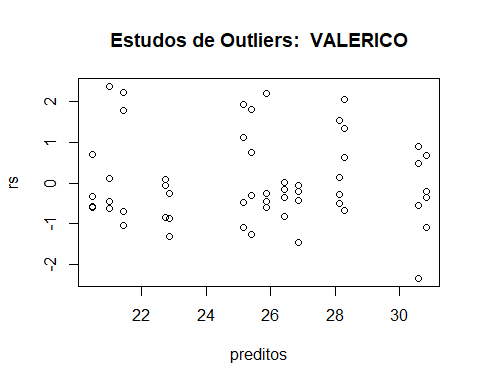
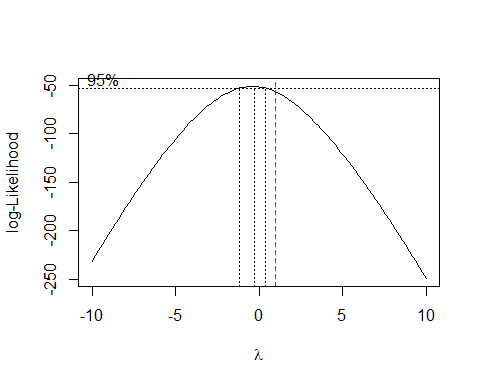
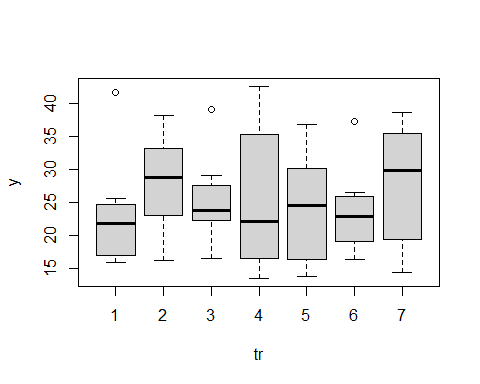
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.91185, p-value = 0.0002308



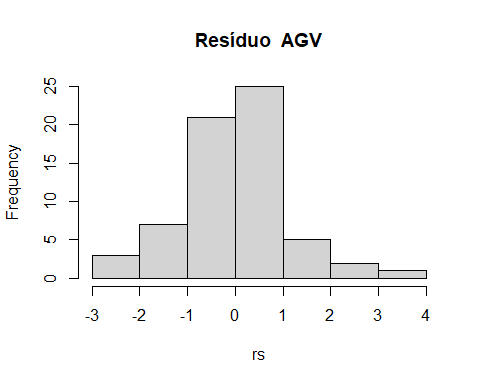
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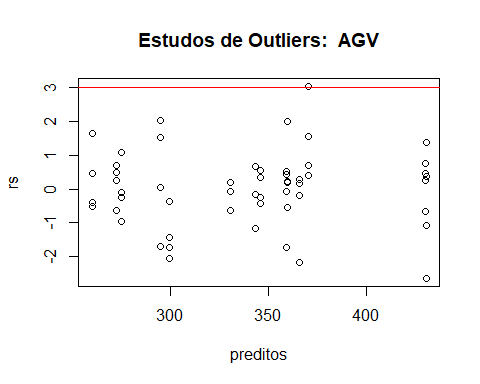
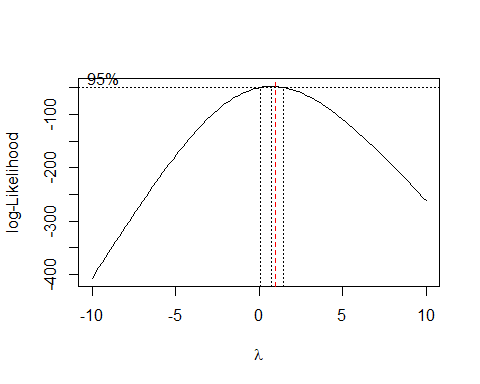
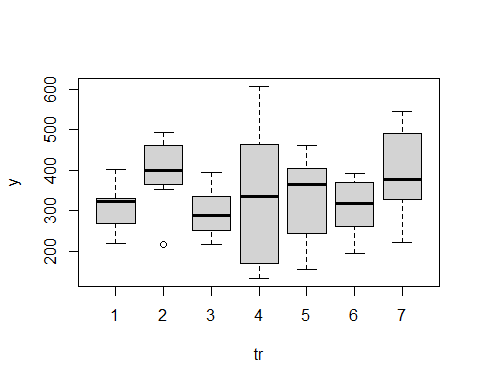
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.90926, p-value = 0.0001822



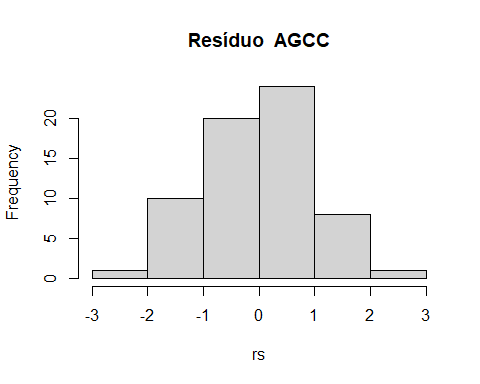
#>   
#> [1] "===================================="  
#> [1] "AGV"  
#> [1] "===================================="



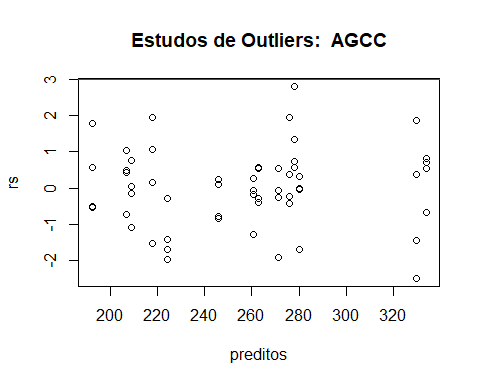
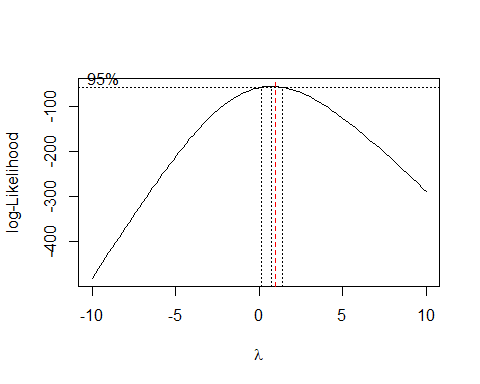
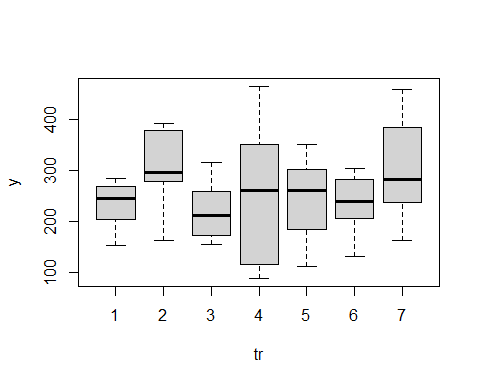
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.97595, p-value = 0.2446



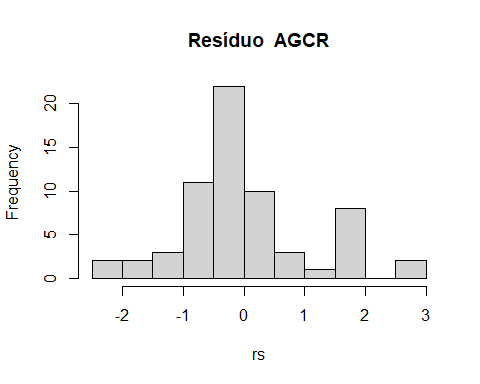
#>   
#> [1] "===================================="  
#> [1] "AGCC"  
#> [1] "===================================="



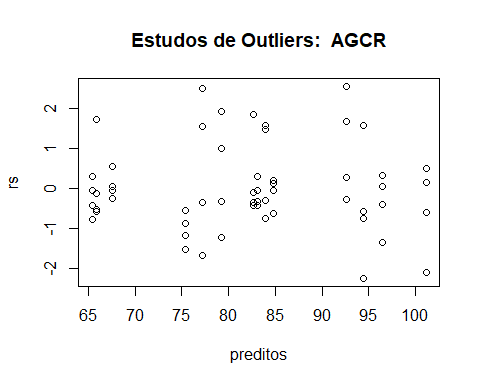
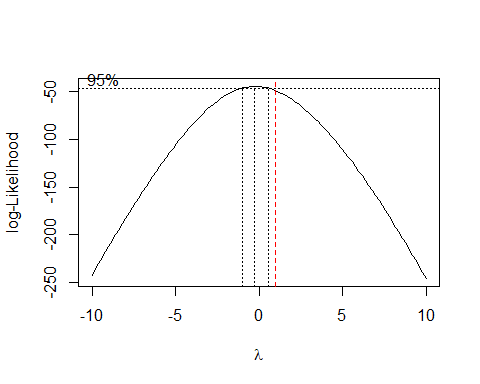
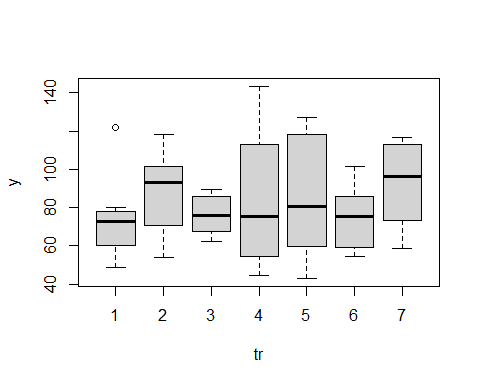
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.98299, p-value = 0.523



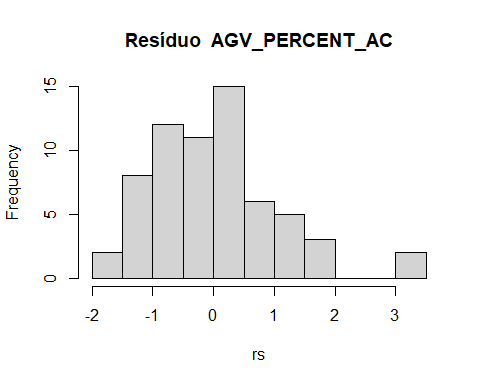
#>   
#> [1] "===================================="  
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#> [1] "===================================="



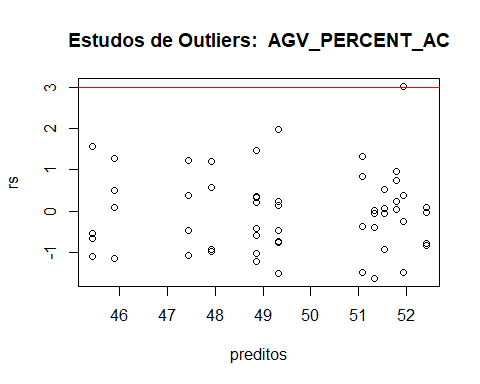
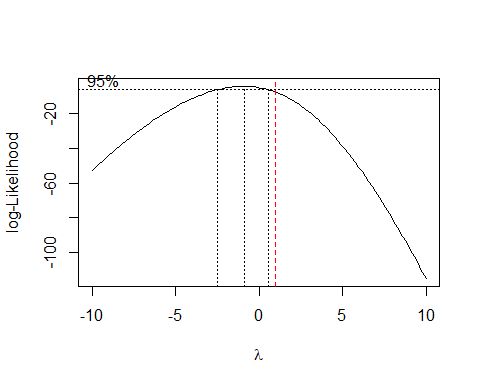
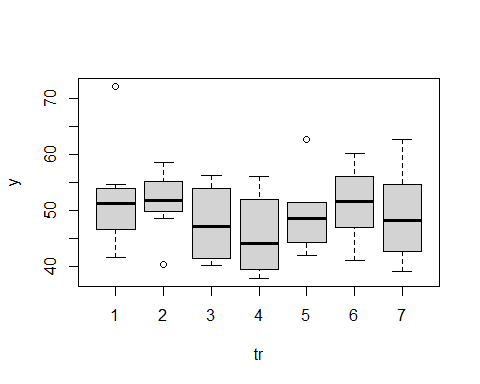
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.93463, p-value = 0.00215



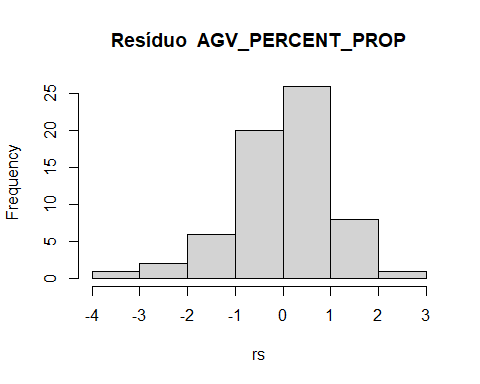
#>   
#> [1] "===================================="  
#> [1] "AGV\_PERCENT\_AC"  
#> [1] "===================================="



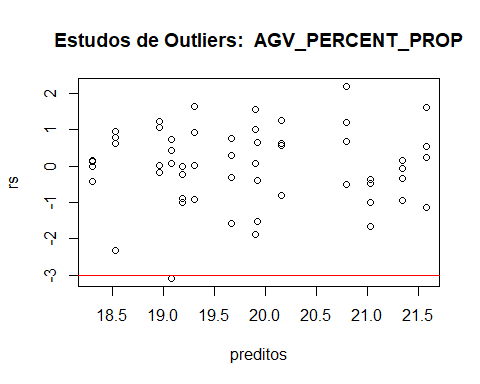
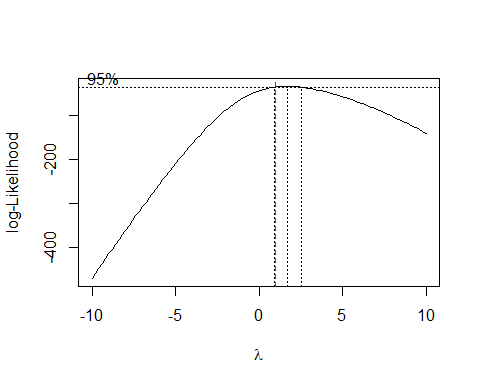
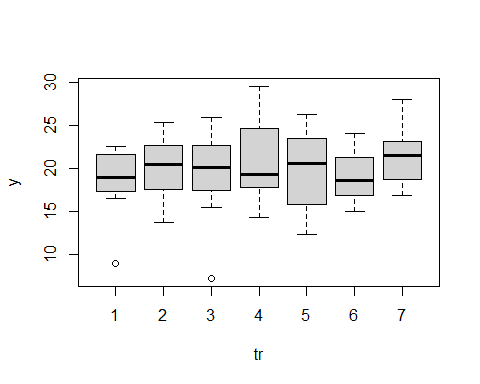
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.94757, p-value = 0.008706



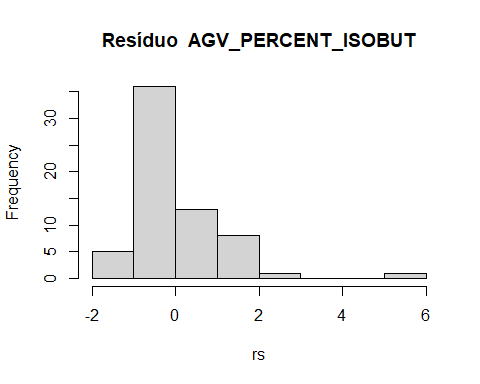
#>   
#> [1] "===================================="  
#> [1] "AGV\_PERCENT\_PROP"  
#> [1] "===================================="



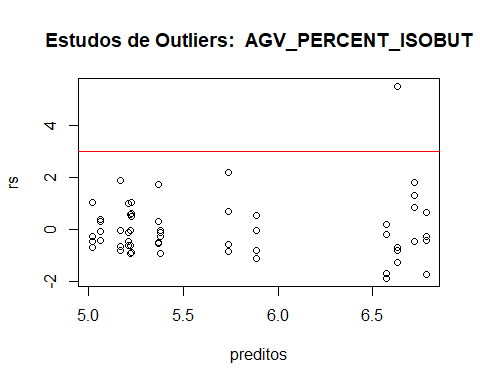
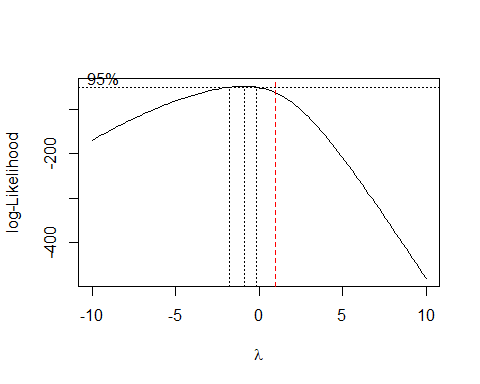
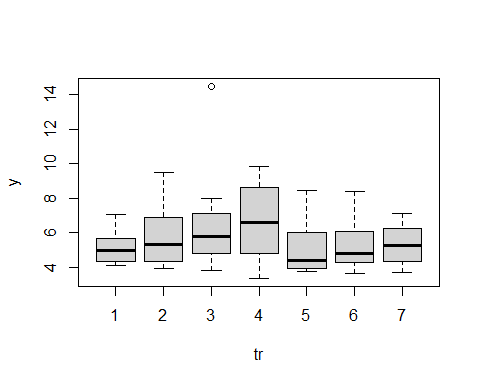
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.97161, p-value = 0.1466



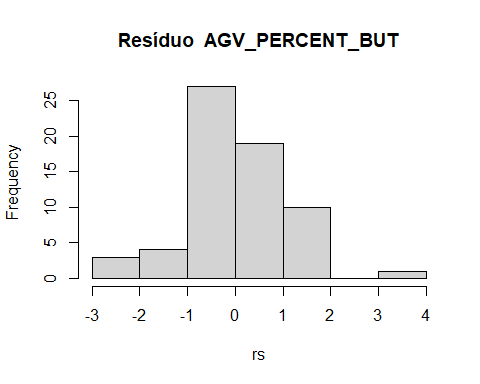
#>   
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#> [1] "AGV\_PERCENT\_ISOBUT"  
#> [1] "===================================="



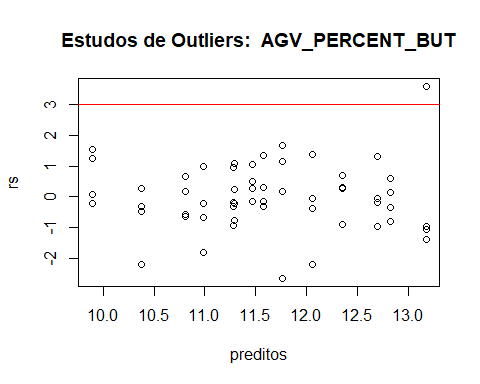
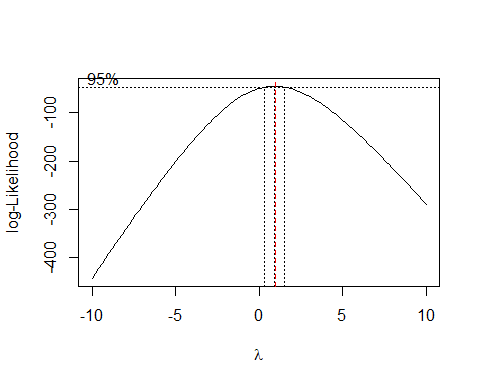
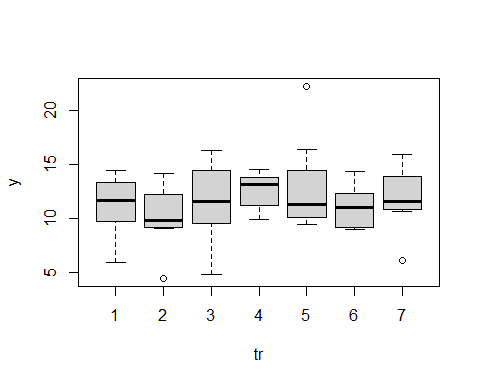
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.84959, p-value = 1.595e-06



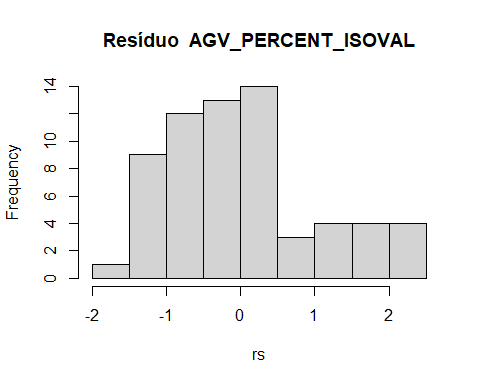
#>   
#> [1] "===================================="  
#> [1] "AGV\_PERCENT\_BUT"  
#> [1] "===================================="



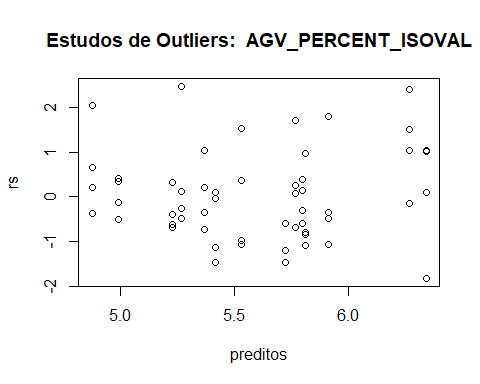
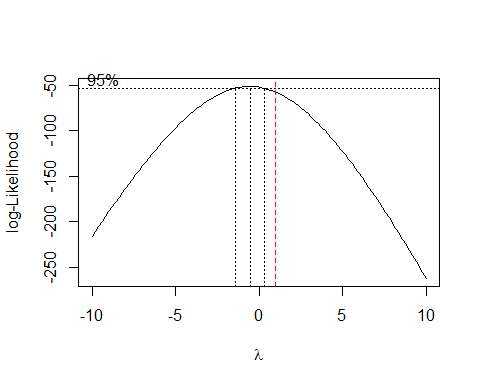
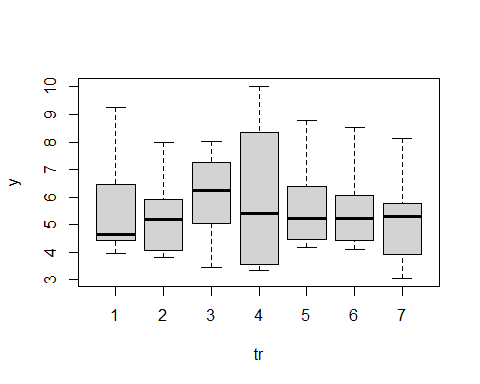
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.96878, p-value = 0.1045



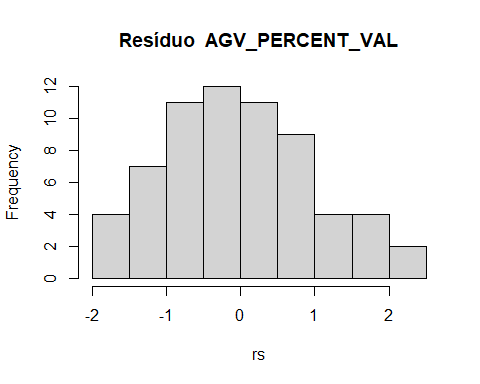
#>   
#> [1] "===================================="  
#> [1] "AGV\_PERCENT\_ISOVAL"  
#> [1] "===================================="



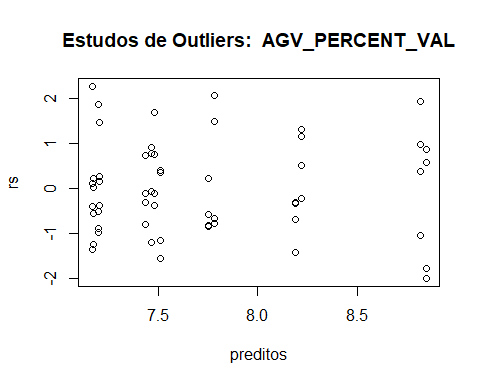
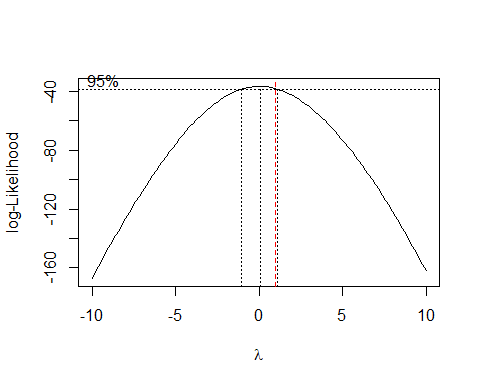
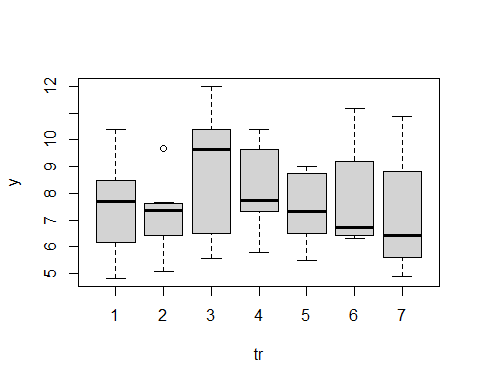
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.94875, p-value = 0.009936



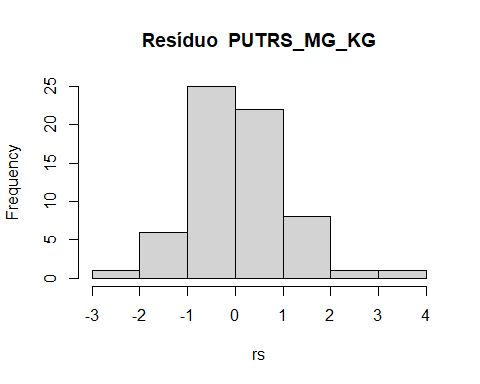
#>   
#> [1] "===================================="  
#> [1] "AGV\_PERCENT\_VAL"  
#> [1] "===================================="



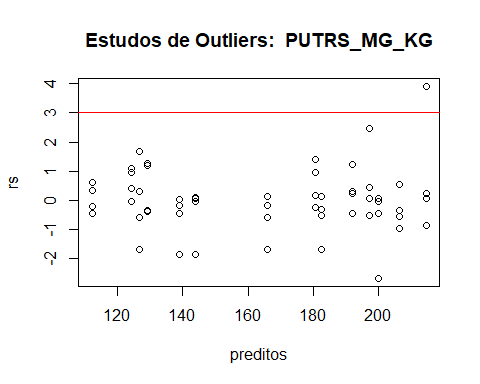
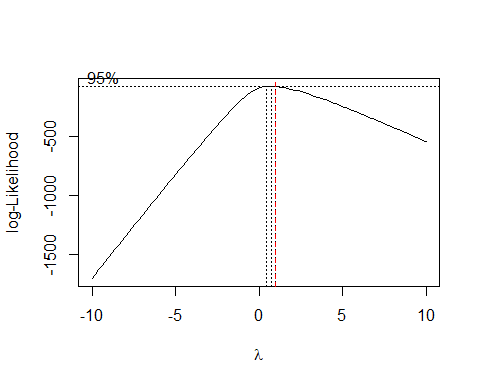
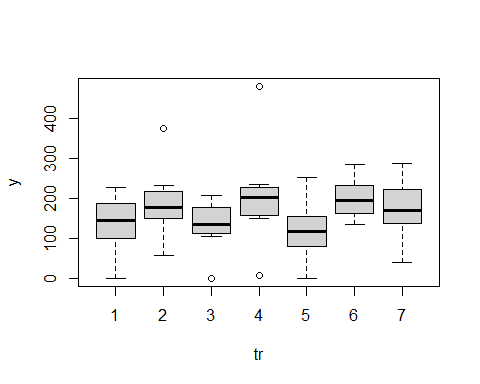
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.98134, p-value = 0.4431



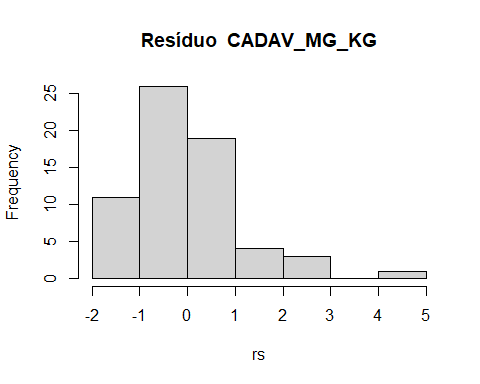
#>   
#> [1] "===================================="  
#> [1] "PUTRS\_MG\_KG"  
#> [1] "===================================="



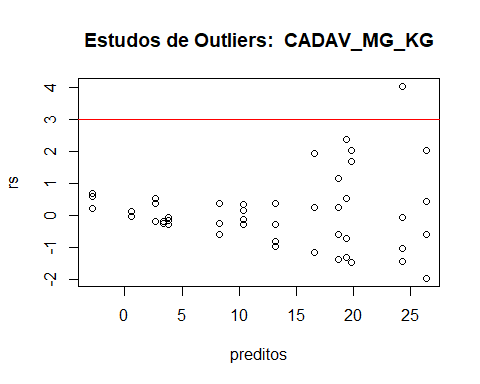
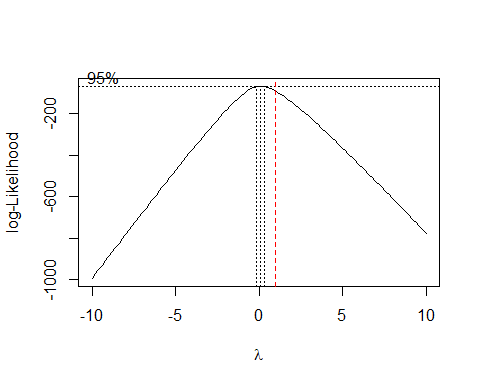
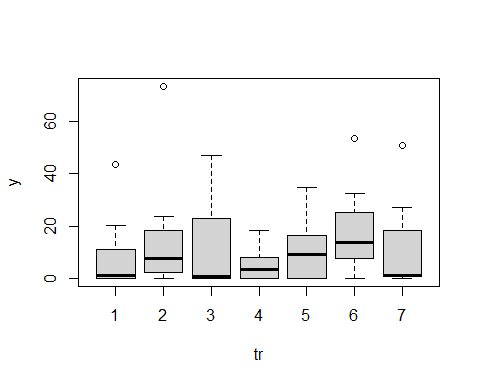
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.9332, p-value = 0.001854



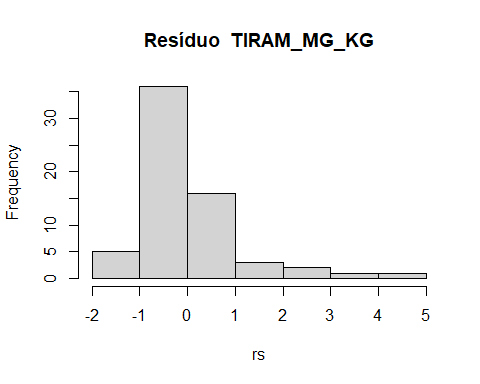
#>   
#> [1] "===================================="  
#> [1] "CADAV\_MG\_KG"  
#> [1] "===================================="



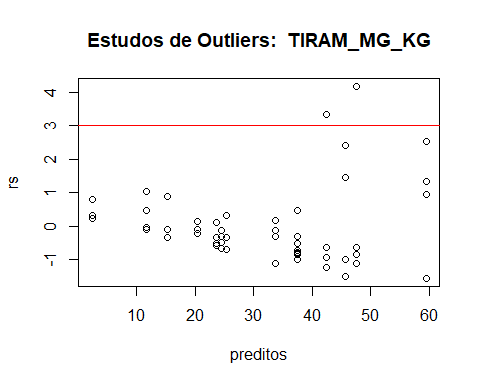
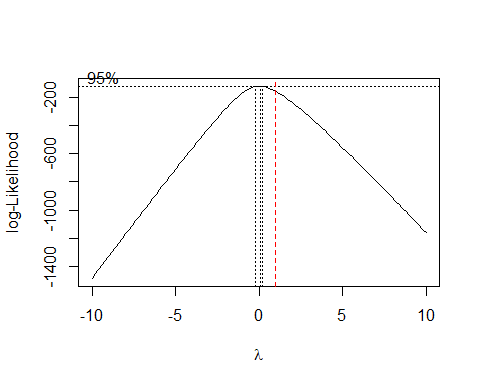
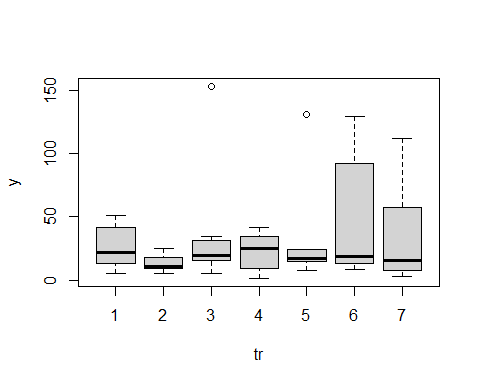
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.90578, p-value = 0.000133



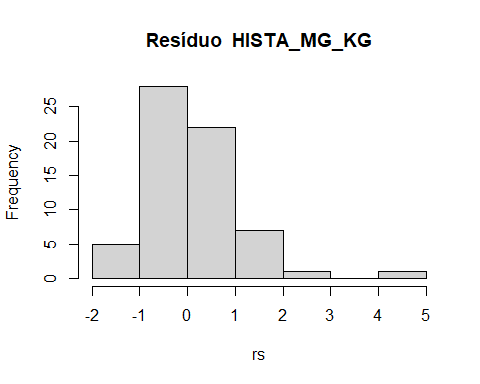
#>   
#> [1] "===================================="  
#> [1] "TIRAM\_MG\_KG"  
#> [1] "===================================="



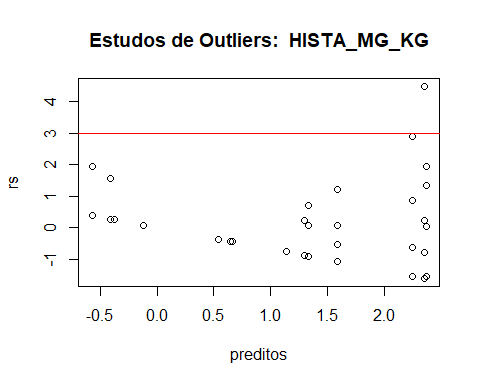
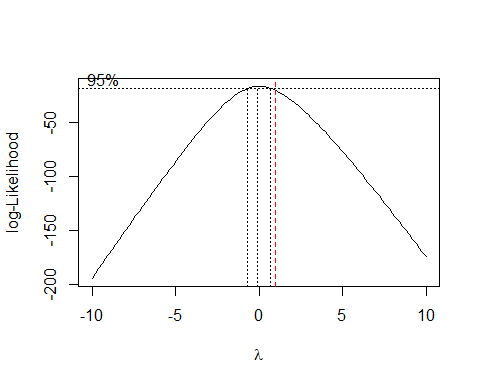
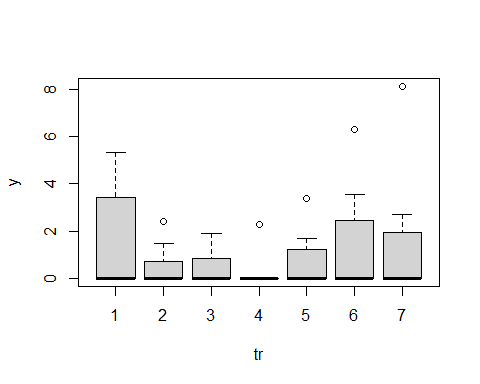
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.85848, p-value = 3.002e-06



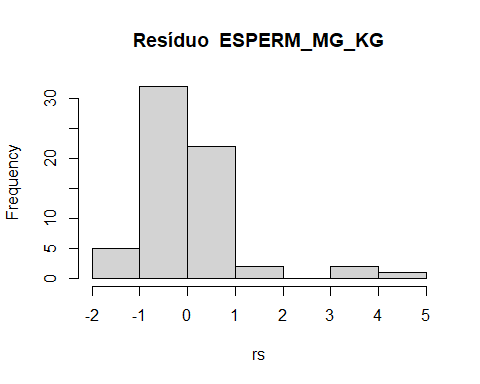
#>   
#> [1] "===================================="  
#> [1] "HISTA\_MG\_KG"  
#> [1] "===================================="



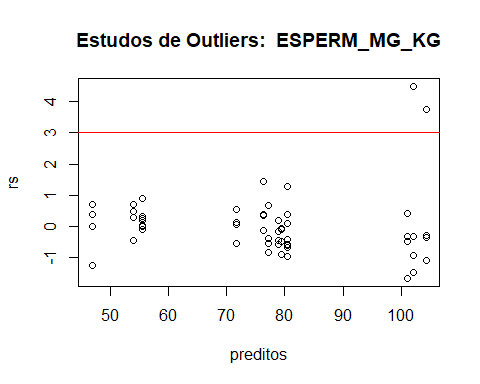
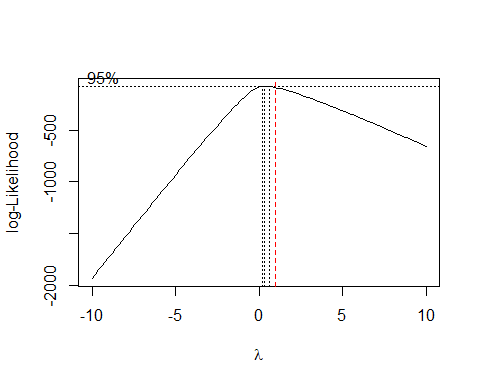
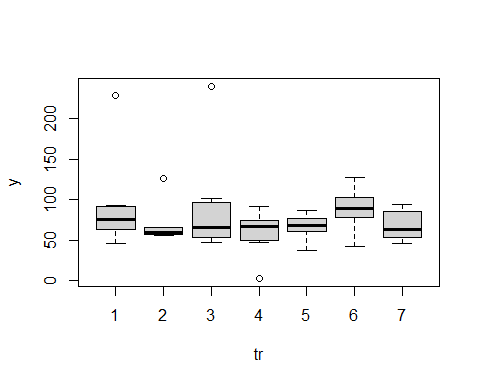
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.86616, p-value = 5.277e-06



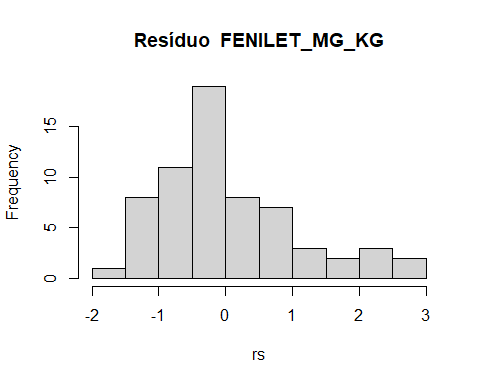
#>   
#> [1] "===================================="  
#> [1] "ESPERM\_MG\_KG"  
#> [1] "===================================="



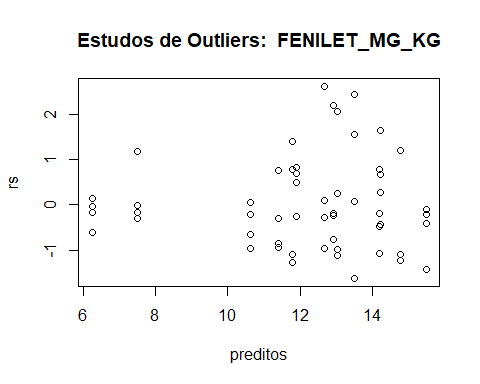
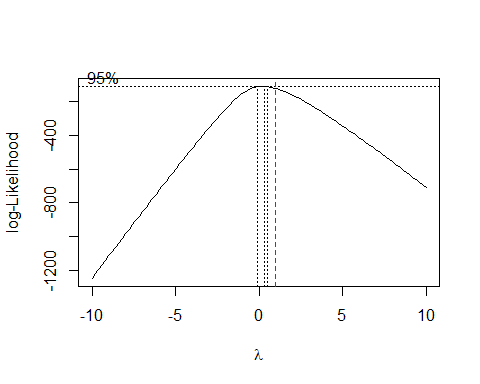
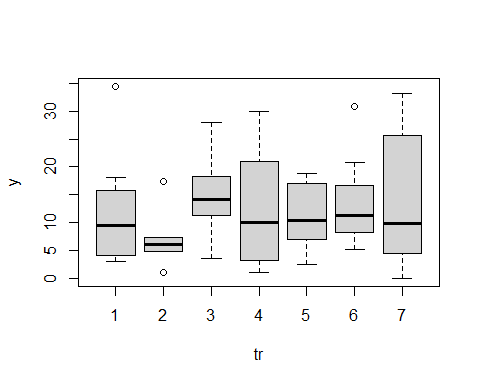
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.77192, p-value = 1.358e-08



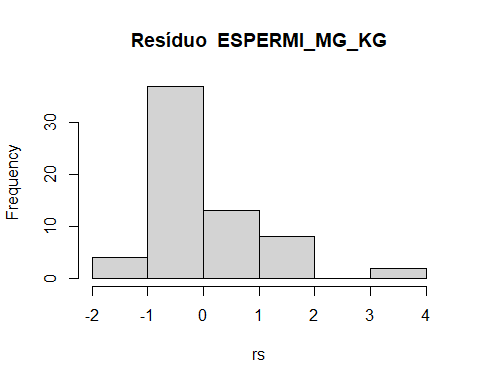
#>   
#> [1] "===================================="  
#> [1] "FENILET\_MG\_KG"  
#> [1] "===================================="



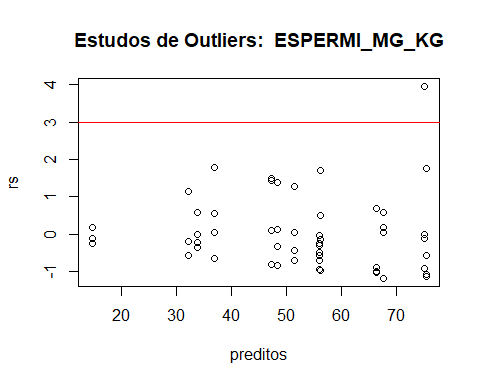
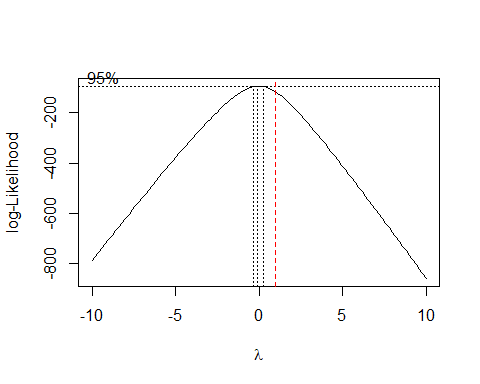
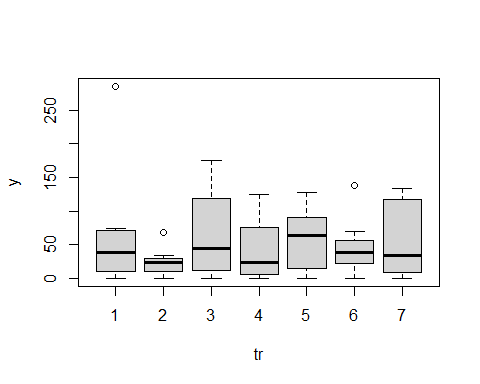
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.92578, p-value = 0.000874



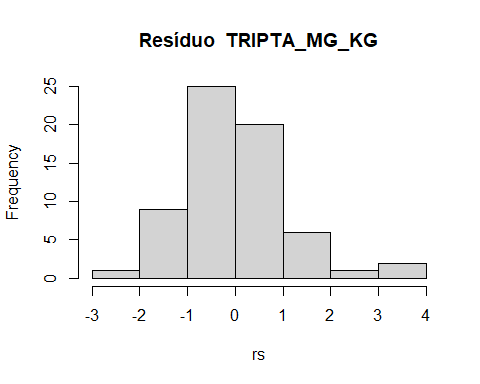
#>   
#> [1] "===================================="  
#> [1] "ESPERMI\_MG\_KG"  
#> [1] "===================================="



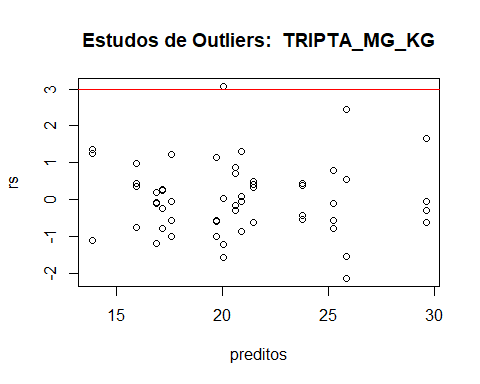
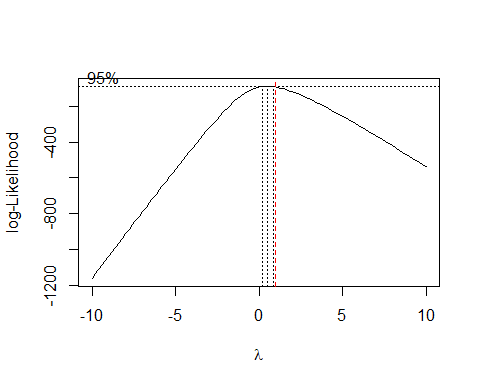
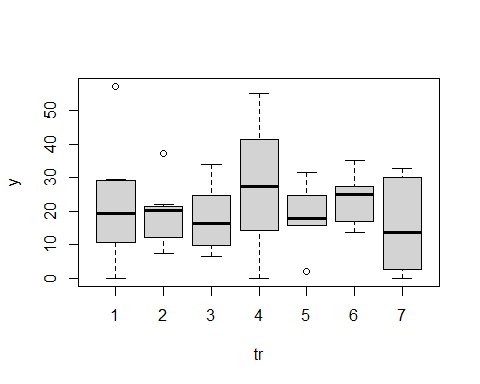
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.82178, p-value = 2.516e-07



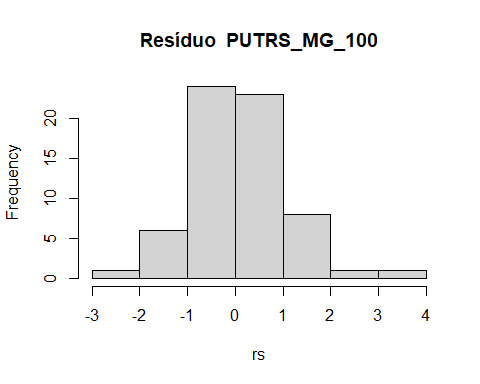
#>   
#> [1] "===================================="  
#> [1] "TRIPTA\_MG\_KG"  
#> [1] "===================================="



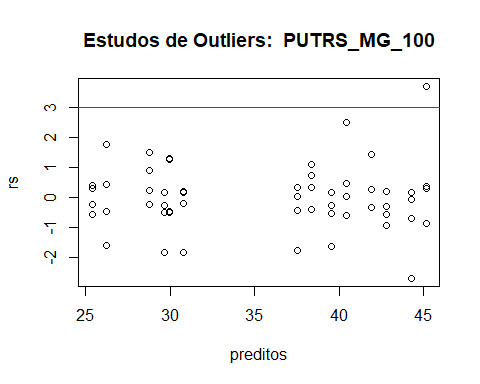
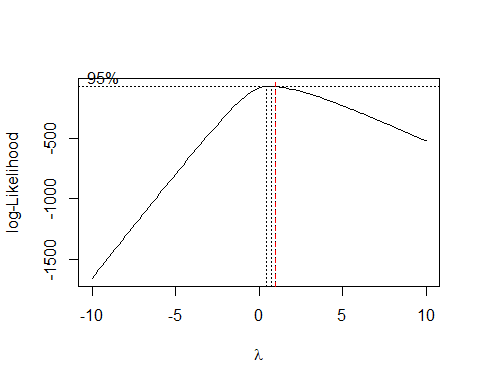
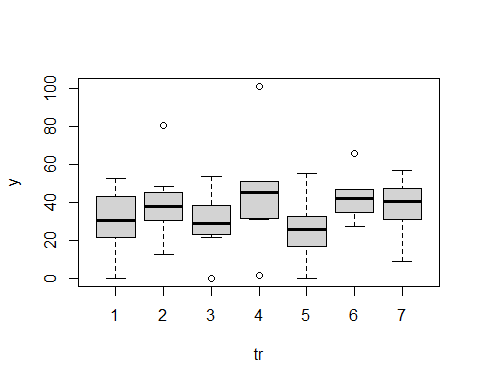
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.95527, p-value = 0.02095



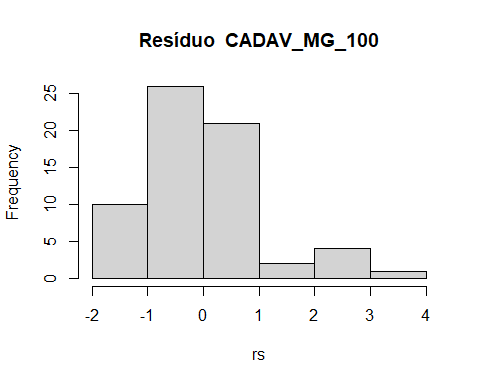
#>   
#> [1] "===================================="  
#> [1] "PUTRS\_MG\_100"  
#> [1] "===================================="



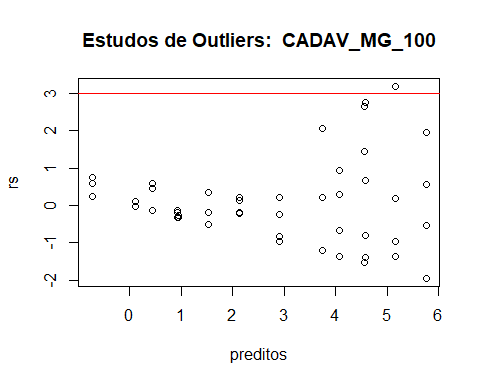
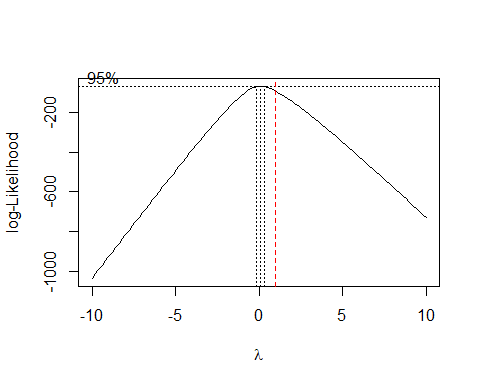
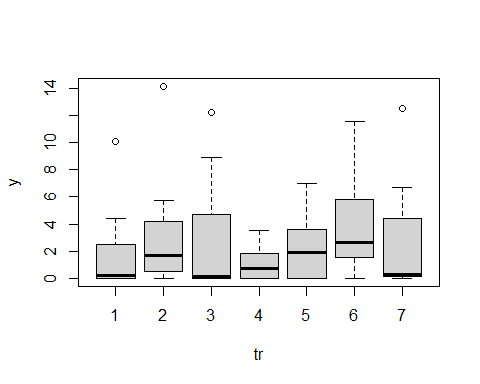
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.94545, p-value = 0.006876



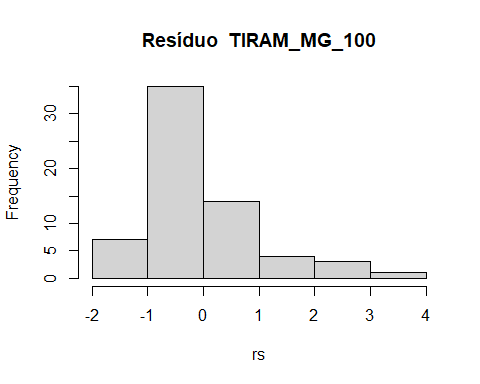
#>   
#> [1] "===================================="  
#> [1] "CADAV\_MG\_100"  
#> [1] "===================================="



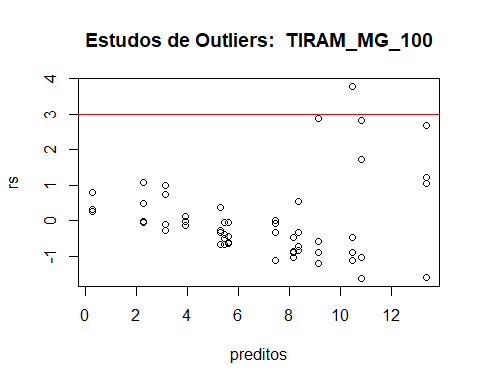
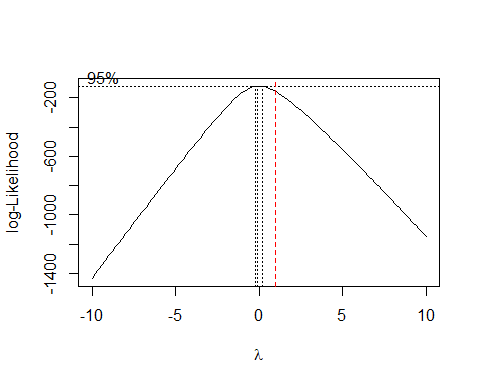
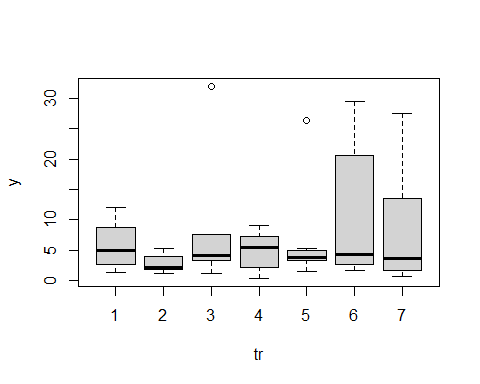
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.91637, p-value = 0.0003517



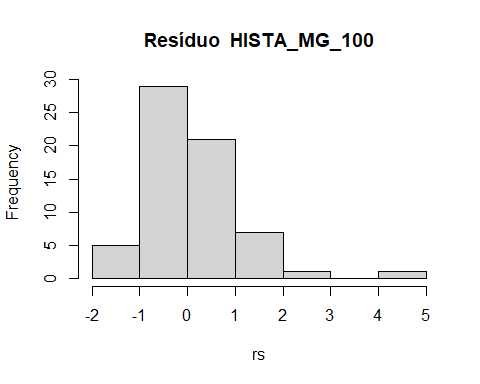
#>   
#> [1] "===================================="  
#> [1] "TIRAM\_MG\_100"  
#> [1] "===================================="



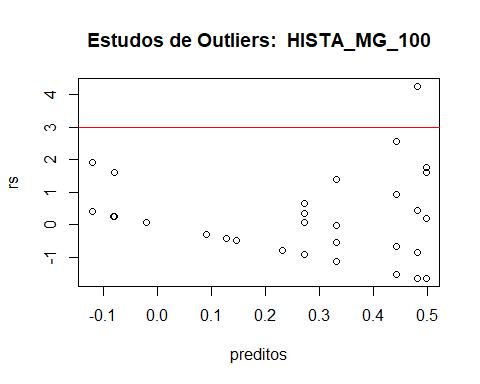
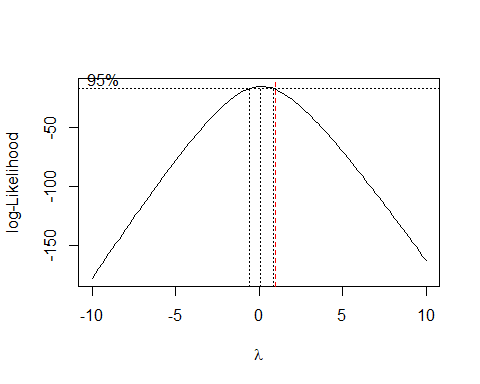
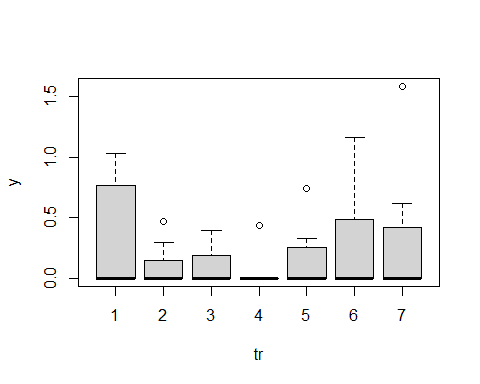
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.87708, p-value = 1.214e-05



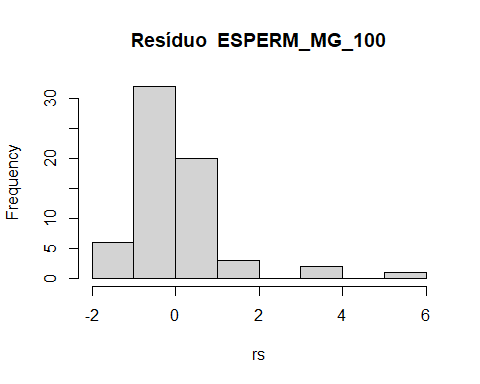
#>   
#> [1] "===================================="  
#> [1] "HISTA\_MG\_100"  
#> [1] "===================================="



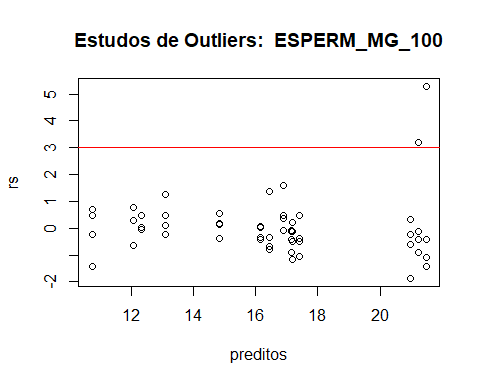
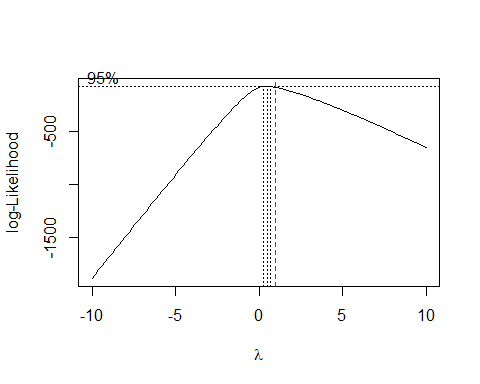
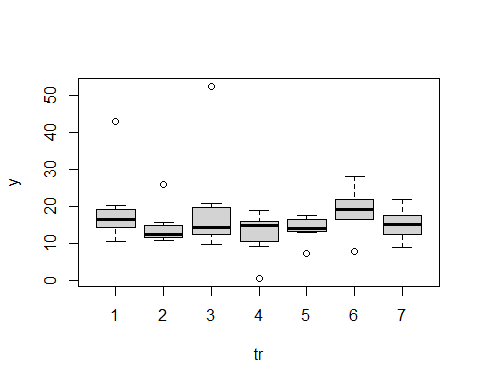
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.89259, p-value = 4.256e-05



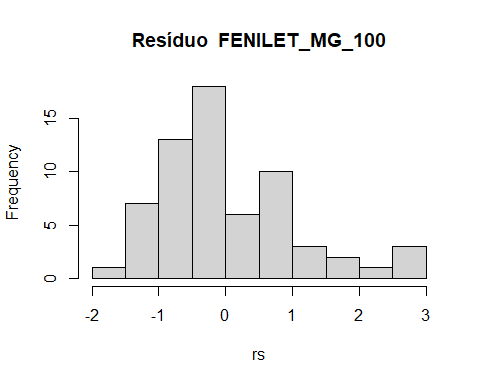
#>   
#> [1] "===================================="  
#> [1] "ESPERM\_MG\_100"  
#> [1] "===================================="



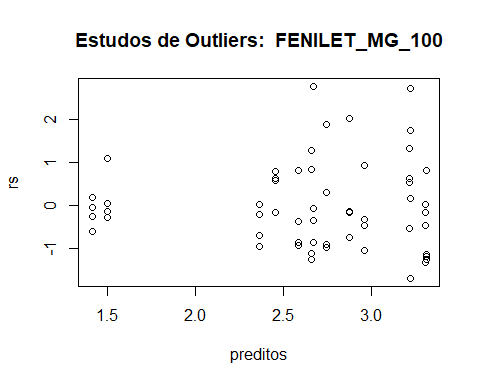
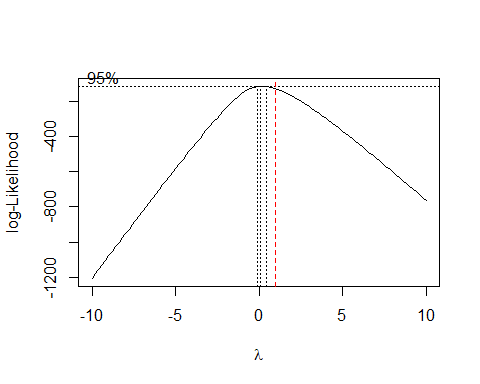
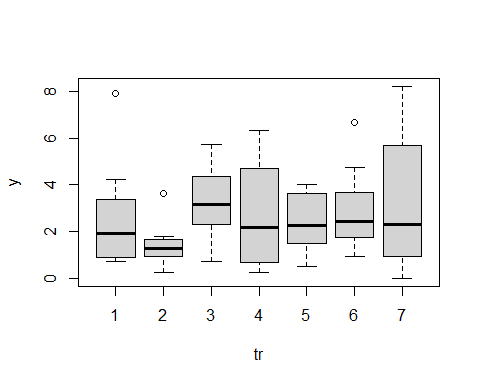
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.7851, p-value = 2.817e-08



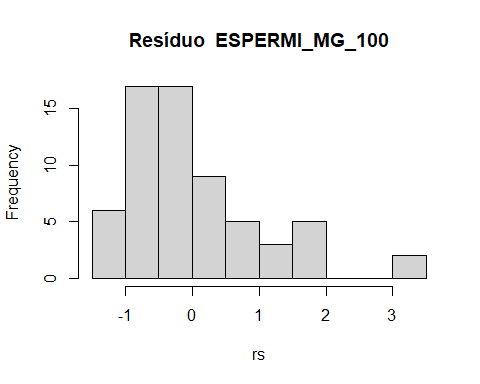
#>   
#> [1] "===================================="  
#> [1] "FENILET\_MG\_100"  
#> [1] "===================================="



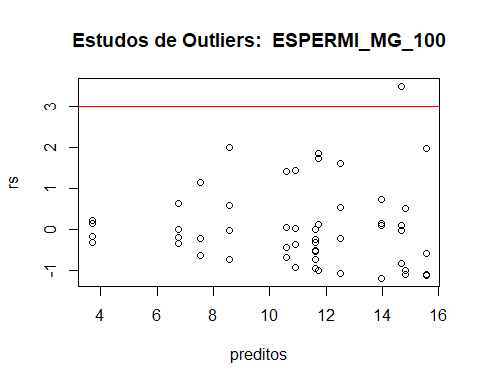
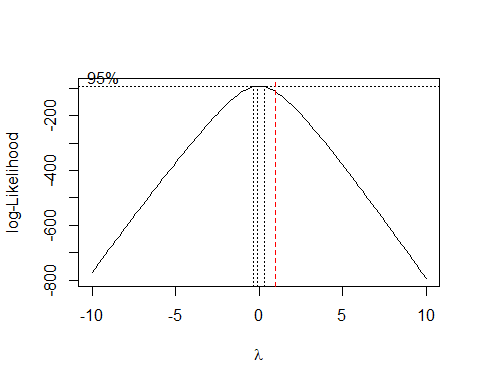
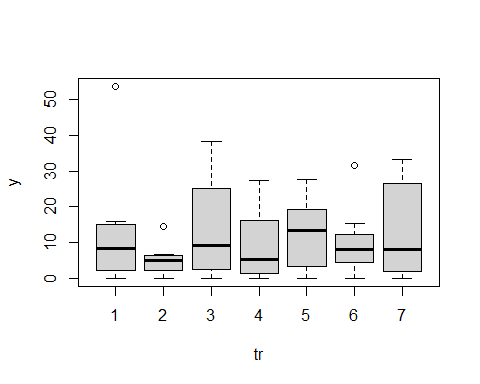
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.92406, p-value = 0.0007374



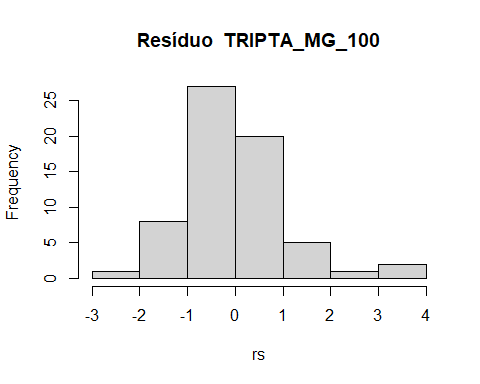
#>   
#> [1] "===================================="  
#> [1] "ESPERMI\_MG\_100"  
#> [1] "===================================="



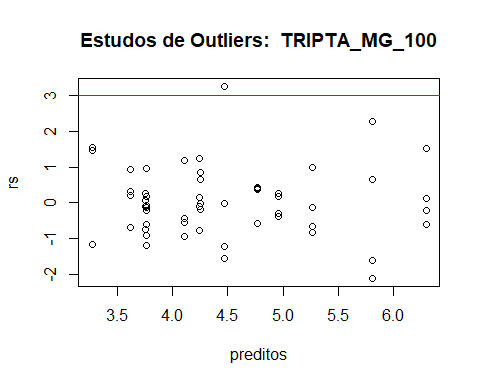
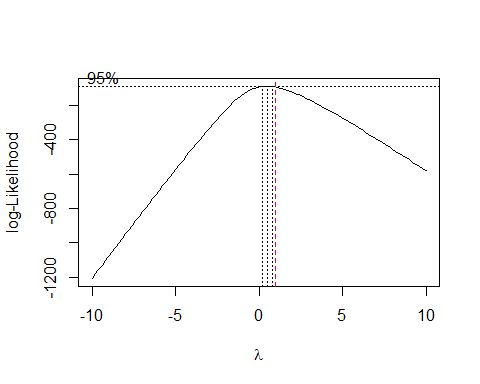
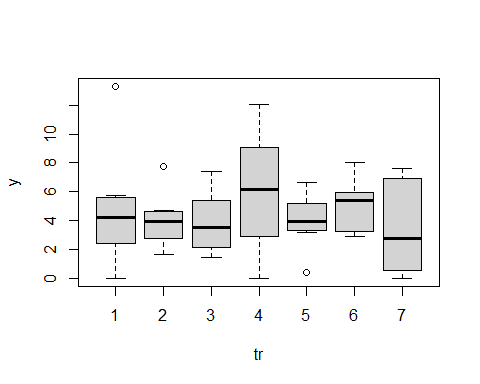
#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.85424, p-value = 2.214e-06



#>   
#> [1] "===================================="  
#> [1] "TRIPTA\_MG\_100"  
#> [1] "===================================="



#>   
#> Shapiro-Wilk normality test  
#>   
#> data: rs  
#> W = 0.94309, p-value = 0.005306



## Análise de variância

# for(i in seq\_along(variaveis)){  
# nome <- names(variaveis[i])  
# print("====================================")  
# print(str\_to\_upper(nome))  
# print("====================================")  
#   
# daux <- variaveis[i]  
# names(daux) <- "y" ### <-  
# y <- daux$y ### <-   
# ingred <- dados$ingrediente %>% as\_factor()  
# dose <- dados$dose  
# bl <- dados$bl %>% as\_factor()  
#   
# fat2.dbc(ingred,dose,bl,y,quali=c(TRUE,FALSE),  
# fac.names = c("Ingred.","Dose"))  
#   
# my\_plot<-tibble(dose,ingred,y) %>%  
# group\_by(dose,ingred) %>%   
# summarise(y=mean(y)) %>%   
# ggplot(aes(x=dose,y=y,color=ingred)) +  
# geom\_point(size=3) +  
# geom\_line() +  
# #facet\_wrap(~ingred,nrow = 2)+  
# theme\_bw() +  
# labs(y=str\_to\_upper(nome),x="DOSE",color="Ingrediente")+  
# theme(legend.position = "top")+  
# scale\_color\_manual(values = c("aquamarine4","red"))   
# print(my\_plot)  
# cat("\n")  
# }