

In this assignment you will explore data that looks at the rate at which calves gain weight. The average daily weight gain (ADG) during 3 to 9 months of age for 3 breed of calves was studied. It was thought that ADG is partly an inherited trait. Thus the ADG of each calf's sire and ADG of each calf's dam (when they were growing during 3 to 9 months of age) were considered as possible covariates.

The data set can be obtained from the "Data Sets" page of the STATS 330 Web page or from the STATS330 folder on the "U:drive" of "My Computer" in the Advanced Lab or in the Undergrad Laboratories. The data consists of the following measurements:

breed: breed of calf, a factor with levels 1, 2 or 3.
adg: average daily weight gain of calf.
sadg: average daily weight gain of calf's sire.
dadg: average daily weight gain of calf's dam.

For this assignment you are to compare the average daily weight gains for the three breeds of calves. You need to fit a model that utilises the covariates if they are needed. Make sure you take into account the covariate terms that you have included in your model when comparing different breeds. Also make sure you run suitable diagnostic checks for your fitted model. If you identify high influence points, you need to discuss how your model and your comparison of breeds would change if these points were dropped.

As usual, your assignment should consist of two parts. The first part should be a report that contains:

1. an executive summary,
2. a description of the data,
3. a fitted model,
4. a comparison of breeds based on your fitted model.

The second part of your assignment is a statistical appendix that explains to the marker what you did. Do not include output for all the things you tried. An explanation of what you did with a few key pieces of evidence (plots and/or output) will suffice. Your statistical appendix should contain the following:

1. An explanation of why you chose the model that you did along with key pieces of supporting evidence.

2. A full set of diagnostics for your model and a discussion of these.
3. Any outliers, high leverage and influential points should be identified and the impact of these observations on the fitted model should be discussed.

This assignment should be handed in to the appropriate box in the basement of the Maths/Physics building by the SMIS Resource Centre, by 4pm on Monday, 7 October.