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ILRST 717

Information about protein Content
of milk data. Taken from
Analysis of Longitudinal data by
Diggle, Liang and Zeger.

- Perform two stage Analysis using
the protein Content data.

Example 1.4. Protein content of milk

In this example, milk was collected weekly from 79 Australian cows and analysed for its protein content. The cows were maintained on one of three diets: barley, a mixture of barley and lupins, or lupins alone. The data were provided by Ms Alison Frensham, and are listed in Table 1.3. Figure 1.4 displays the three subsets of the data corresponding to each of the three diets. The repeated measurements on each animal are joined to accentuate the longitudinal nature of the data set. The objective of the study is to determine how diet affects the protein in milk. It appears from the figure that barley gives higher values than the mixture, which in turn gives higher values than lupins alone. A plot of the average traces for each group (Diggle, 1990) confirms this pattern. One problem with simple inferences, however, is that in this example, time is measured in weeks since calving, and the experiment was terminated 19 weeks after the earliest calving. Thus, about half of the 79 sequences of milk protein measurements are incomplete. Calving date may well be associated, directly or indirectly, with the physiological processes that also determine protein content. If this is the case, the missing observations should not be ignored in inference. This issue is taken up in Chapter 11.

