crossdes — A Package for Design and Randomization in Crossover Studies

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Design of experiments for crossover studies requires dealing with possible order and carryover effects that may bias the results of the analysis. The classical approach to deal with those effects is to use designs balanced for the respective effects. Almost always there are effects unaccounted for in the statistical model that may or may not be of practical importance. A convenient way of addressing those effects is randomization. Different kinds of models, however, require different methods of randomization. For many types of experimental designs it is not known whether a certain method of randomization is conformable with a certain model.

The construction of balanced designs is often based on latin squares. The package *crossdes* contains some functions to construct designs balanced for carryover effects like the ones promoted in Wakeling and MacFie (1995). Simulation functions are provided that test whether some basic randomization procedure may be applied to a given design so that one-way or two-way block models give unbiased estimates for mean and variance of treatment contrasts. Here an approach similar to that of Kunert (1998) and Kunert et al. (2002) is used. The simulations done in **R** help to assess the use of experimental designs that are not fully balanced for carryover or period effects in crossover studies (Kunert and Sailer, 2004).

Supplementary functions for randomization and checking for balance of any given design are also provided. The beer testing experiment presented in Kunert (1998) will be discussed as an example.

References:

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