6S (SixS): STOCHASTIC SIMULATION SOFTWARE FOR SUSTAINABLE SELECTION SCHEMES

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OBJECTIVE
Program to stochastically simulate and select animal populations of multi- or uni-parous species based on user-designed schemes. 6S (SixS) version 1.1 is a teaching tool.

COMPUTING METHODS
The choice of algorithms is: truncation selection with avoidance of related individuals and optimal selection based on various means of constraining inbreeding (e.g., Wray and Goddard, 1994, Meuwissen, 1997). Selection criteria may be either phenotypic or estimated breeding values. Different mating allocation routines may be applied (e.g., random, assortative, avoiding relatives). The program can simulate a new base population or use a saved one, as well as starting from the last generation (set of live animals) of an already selected population (either simulated or real).

USE
The input is entered via the user interface (figure). The user interface is a matrix of edit-cells with a fixed number of rows pertaining to operational variables and a changeable number of columns accommodating different schemes, also allowing operational variables to change over time/generations. The operational variables are: scheme/population id, units of time or generations, population structure, information about the trait or index considered, selection and mating decisions. The user specifies the options entering number codes that are exemplified for each operational variable in a popup window. Separate options can be applied to males and to females. The output summaries (figure) combine information about generated relationships and gain, e.g., actual coefficients/values, trends and/or rates of change for: inbreeding, genetic contributions, relationships, phenotypes, estimated and true breeding values. Data can be saved on disk for later use.

AVAILABILITY
The program is available from the authors free of charge.

COMPUTING ENVIRONMENT
The program requires an ordinary PC with Windows.

REFERENCES
FIGURE 1. 6S - User interface and sample output - SixS

Example of bottleneck scheme