

1. OPEN EAAP.xls & ENABLE MACROS

If a dialog box (Figure 1) opens automatically with a message about macros, choose to “Enable Macros.” In cases when this box does not show up or a warning message (Figure 2) shows up, you should lower the macro security level to “Medium” as shown in Figure 3 in order to use all the functions in EAAP. Close the Excel program and reopen it in order to enable macros capabilities (Figure 1).

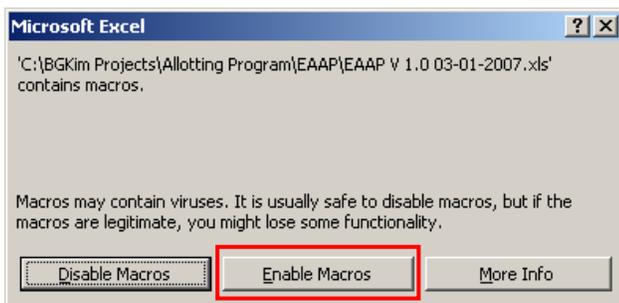


Figure 1. A dialog box asking whether to disable or enable macros. When you open the file EAAP.xls, a dialog box will appear asking if you want to enable macros or not. Choose to *Enable Macros*.



Figure 2. A warning message about macro security. Click *OK*.

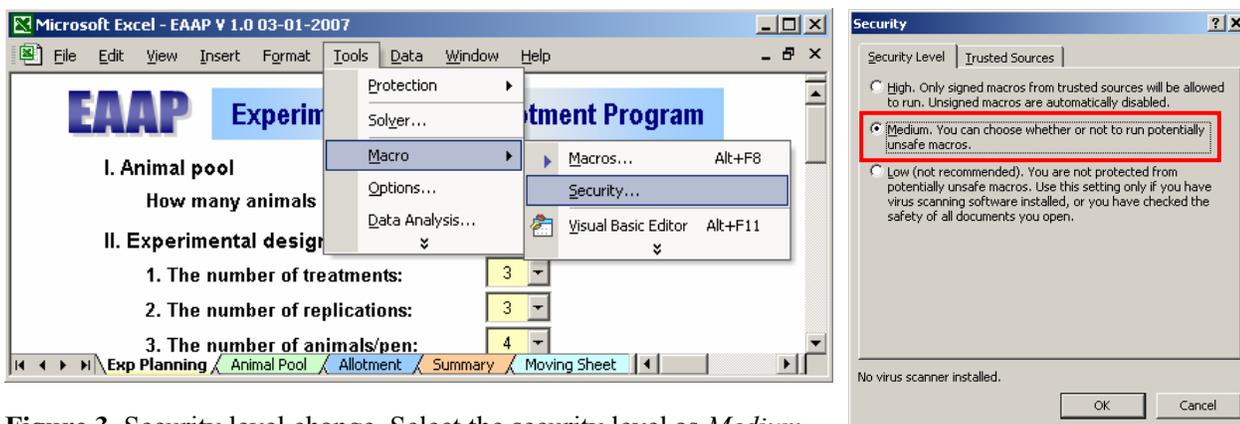


Figure 3. Security level change. Select the security level as *Medium*.

2. EXPERIMENTAL PLAN INPUT

On the “Exp Planning” screen, a user can input experiment information, including the number of available animals, treatments, replications, and animals/pen (Figure 4-a~d). Experimental design choices (Figure 4-e) include CRD (completely randomized design), RCB (randomized complete block design), and conventional method (individually sort by BW and assign treatments as ABCD, DCBA, ABCD, DCBA, ...). The conventional method is, technically, not a randomization.

If gender should be considered in the allotments, a user can check the checkbox (Figure 4-f) in the Gender category. If gender is to be considered as a blocking factor (Figure 4-g), a user can select the number of male blocks

(Figure 4-i). The number of female blocks (Figure 4-j) is updated automatically. If a user wants to have balanced numbers of males and females in each pen (Figure 4-h), he can select the number of males per pen (Figure 4-k). The number of females per pen (Figure 4-l) is updated automatically.

The CV allowance function (Figure 4-m) randomizes treatment allotment until the CV within each block meets the user-assigned allowance (Figure 4-n). A user also assigns the maximum number of randomization loops (Figure 4-o) to meet the CV allowance.

Clicking the “OK” button (Figure 4-p) or the “Animal Pool” tab will check the correctness of the number input. If any incorrect number input is found, an error message will result (Figure 5). If all the inputs are found to be correct, the “Animal Pool” sheet will be activated (Figure 6).

Figure 4. Experiment planning sheet.

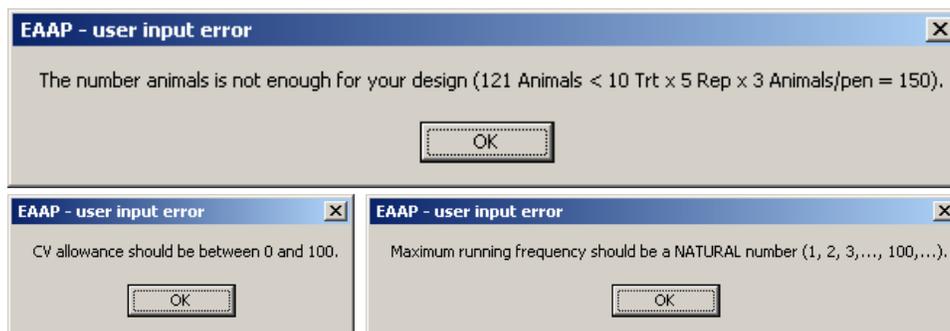


Figure 5. User input error messages

3. ANIMAL INFORMATION INPUT

In the “Animal Pool” sheet, a user can input the current location (or pen number), identification number, body weight, gender, and ancestry of animals (Figure 6). The identification number and body weight information should be input. Current location (or pen number) of animals is important information when animals are actually relocated to experimental pens. The gender of animals should be input as “M” or “F” if gender is to be considered in the allotment (Figure 4-f). Maternal and paternal ancestry information is relatively optional, but may be needed to check a biased ancestry of a pen. If any previous data exist, a user can click the “Clear Current Data” button to clear and reformat the cells.

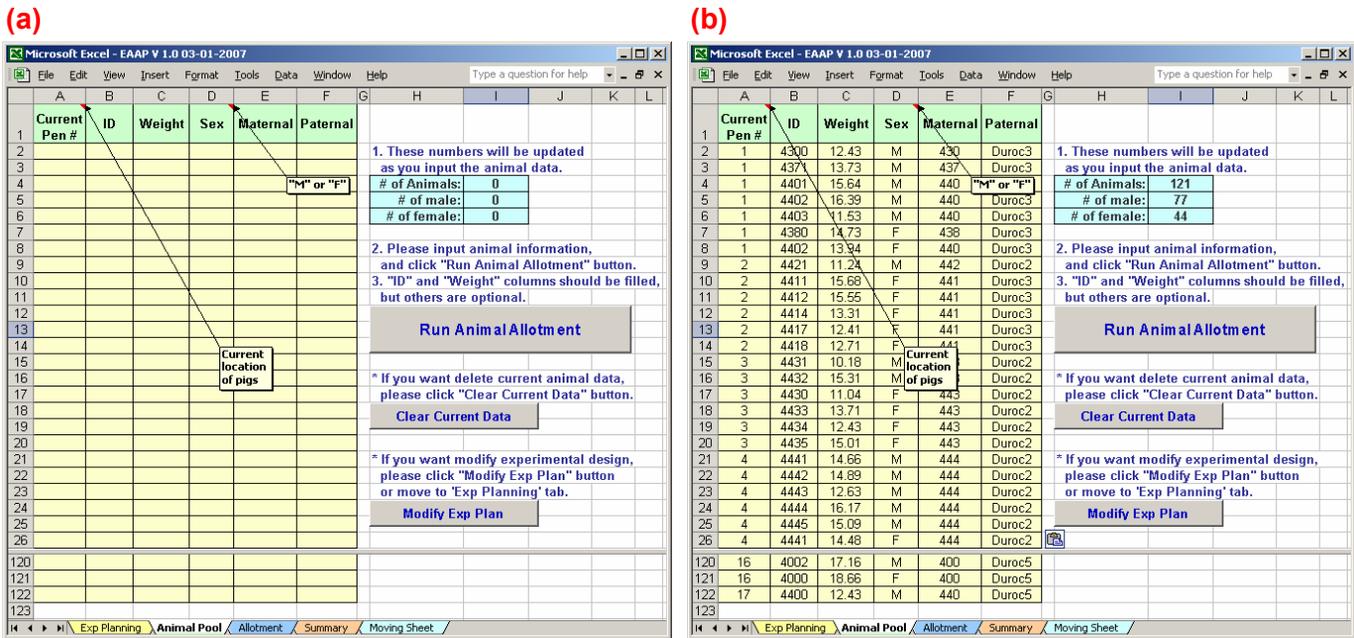


Figure 6. A sheet for information of available animals (a) and an example of input (b).

A user may type animal information, or copy it from another worksheet and paste it here (Figure 6-a). As animal body weights and genders are input into the light yellow cells, the counts for animals, males, and females in the sky blue color cells will be instantly changed. If a user wants to modify the experimental design, clicking the “Modify Exp Plan” or “Exp Planning” tab will activate the “Exp Planning” sheet.

The “Run Animal Allotment” button will start to run the animal allotment based on the user-assigned experimental design and the animal information. The allotment procedure is performed in the “Allotment” sheet, and the result is displayed and summarized in the “Summary” sheet. If the quantity of one gender is not enough for the experimental plan, an error message will show up and ask a user to change the experimental plan or edit the information of animals available (Figure 7).



Figure 7. User input error message due to insufficient number of a gender

4. ALLOTMENT RESULT AND SUMMARY

In the “Summary” sheet (Figure 8), an allotment result and a summary table will be displayed. The former shows individual animals in each replication (block) and treatment group; the latter demonstrates mean values of animal weight for each pen, treatment, and replication (block). The CV of treatment values for each block is also shown in blue. If the gender is considered as a blocking factor (Figure 4-g), the gender for each block (replication) is specified on the bottom of the summary table. If the CV values are not low enough (the treatment means within the block are not homogeneous - although “enough” is a rather subjective term), a user may open the “Exp Planning” tab, lower the CV allowance, and run the allotment again.

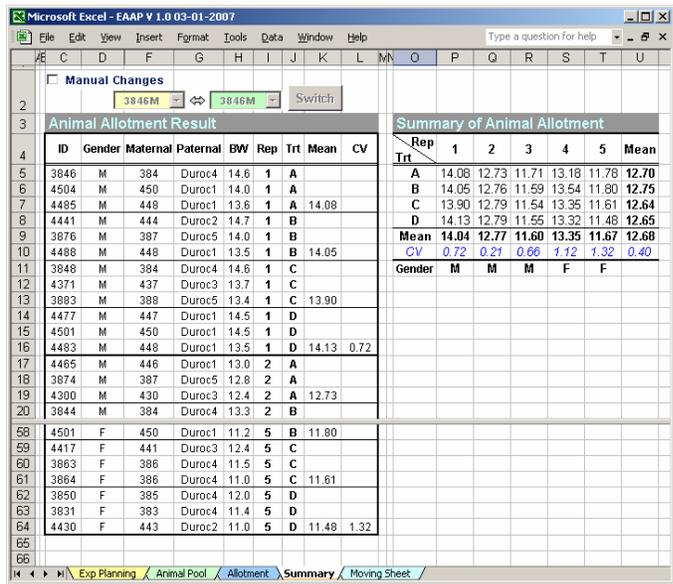


Figure 8. An allotment result and a summary table.

If maternal and/or paternal ancestry is provided in the “Animal Pool” sheet (Figure 6), the ancestry information for individual animals will be shown in the allotment result. A user may check if a biased ancestry exists within a pen and switch the animals. When the manual change function is checked (Figure 9-a), animal selection boxes and the “Switch” button are activated. In this example (Figure 9-a), treatment B and D in replication (block) four are relatively biased: two animals in each pen are littermates, and all three animals share a paternal source. Thus, “4414F” and “4433F” are switched (Figure 9-b). If the switch results in unexpected changes of pen means and/or block CV, a user may click the “Switch” button again to undo the change.

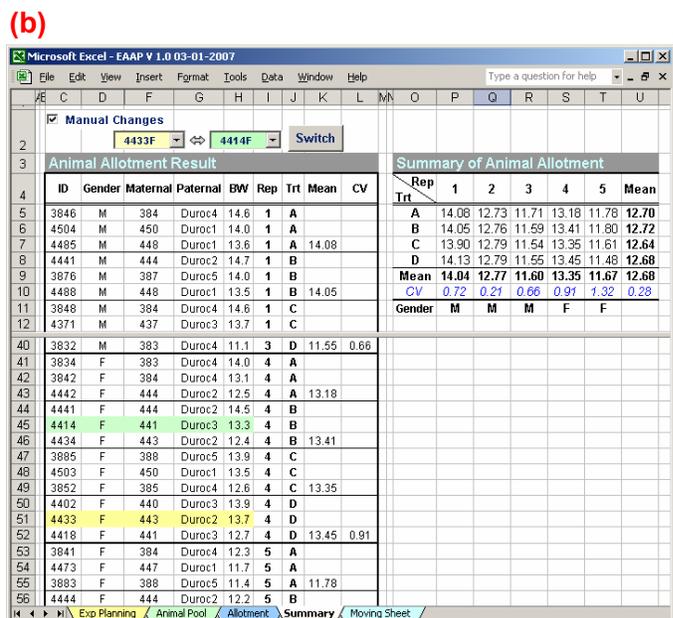
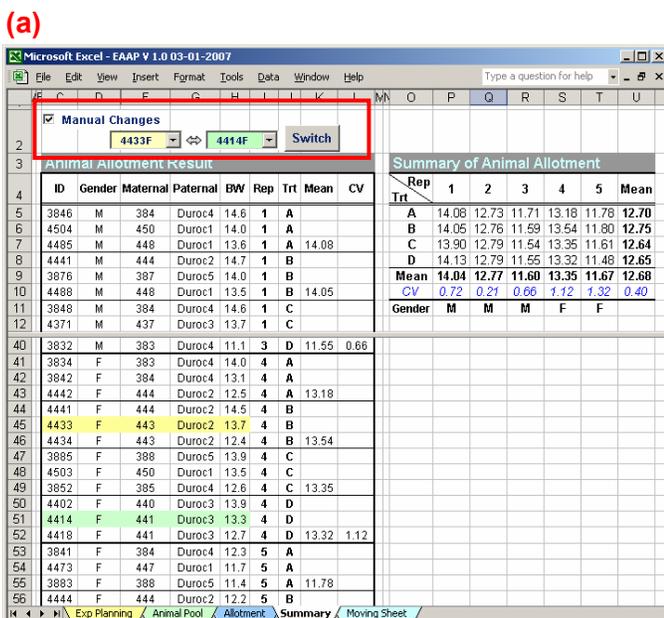


Figure 9. Manual correction of a biased ancestry of a pen (a, pre-correction; b, post-correction).

5. ACTUAL MOVING SHEET

For the convenience of finding animals to be used for the experiment, all the animals from the “Animal Pool” sheet (Figure 6-b) are listed and sorted by current location (pen number) in the moving sheet (Figure 10). Assigned replication (block) and treatment for each animal are shown, and the animals that are not used for the experiment are labeled as “Ex.” If a user finds an unnecessary column, the column can be hidden (Figure 11).

Current Pen #	ID	Gender	Maternal	Paternal	Weight	Rep	Trt
1	4401	M	440	Duroc3	15.64	Ex	Ex
1	4402	M	440	Duroc3	16.39	Ex	Ex
1	4403	M	440	Duroc3	11.53	3	C
1	4371	M	437	Duroc3	13.73	1	C
1	4300	M	430	Duroc3	12.43	2	A
1	4402	F	440	Duroc3	13.94	4	D
1	4380	F	438	Duroc3	14.73	Ex	Ex
2	4421	M	442	Duroc2	11.24	3	A
2	4411	F	441	Duroc3	15.68	Ex	Ex
2	4412	F	441	Duroc3	15.55	Ex	Ex
15	3880	F	388	Duroc5	9.1	Ex	Ex
15	3881	F	388	Duroc5	8.13	Ex	Ex
15	3882	F	388	Duroc5	8.79	Ex	Ex
15	3883	F	388	Duroc5	11.38	5	A
15	3884	F	388	Duroc5	8.36	Ex	Ex
15	3885	F	388	Duroc5	13.92	4	C
16	4000	M	400	Duroc5	16.91	Ex	Ex
16	4001	M	400	Duroc5	18.48	Ex	Ex
16	4002	M	400	Duroc5	17.16	Ex	Ex
16	4000	F	400	Duroc5	18.66	Ex	Ex
17	4400	M	440	Duroc5	12.43	2	B

Figure 10. A moving sheet sorted by current pen number (location).

Current Pen #	ID	Gender	Maternal	Paternal
1	4401	M	440	Duroc3
1	4402	M	440	Duroc3
1	4403	M	440	Duroc3
1	4371	M	437	Duroc3
1	4300	M	430	Duroc3
1	4402	F	440	Duroc3
1	4380	F	438	Duroc3
2	4421	M	442	Duroc2
2	4411	F	441	Duroc3
2	4412	F	441	Duroc3

Figure 11. Hiding unnecessary columns.