

Aspects of sex in animal experiments Lecture & Practicals II

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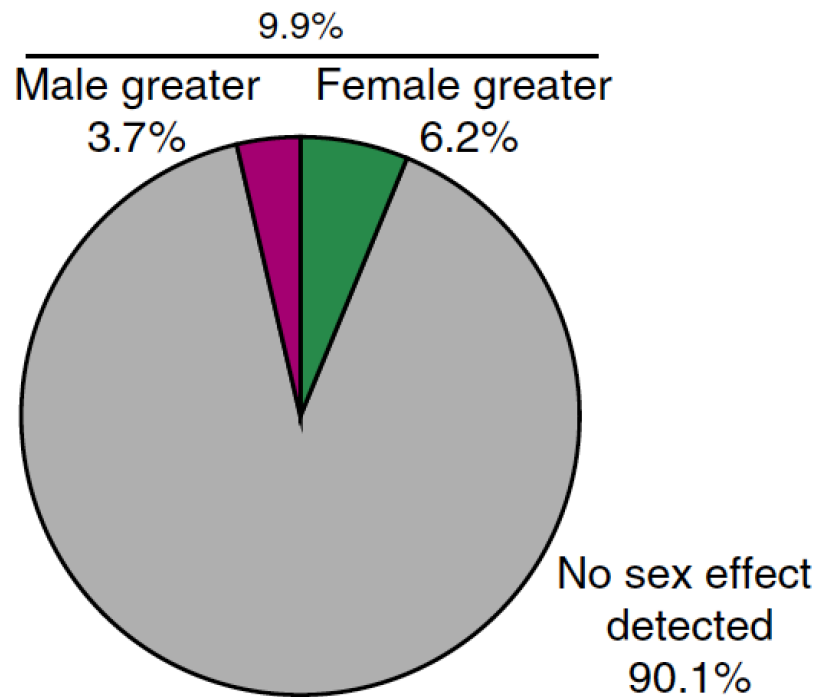
Institute of Laboratory Animal Science



Is biological sex a relevant problem in research?

Sex as a biological variable in control data

Categorical Data

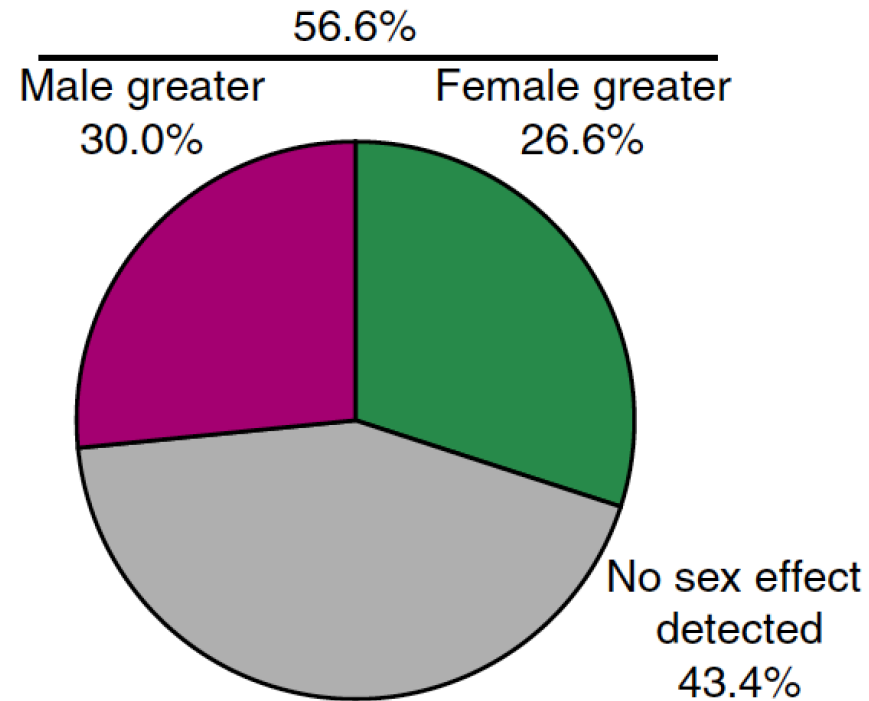


14,250 wildtype

40,192 mutant mice

Sex as a biological variable in control data

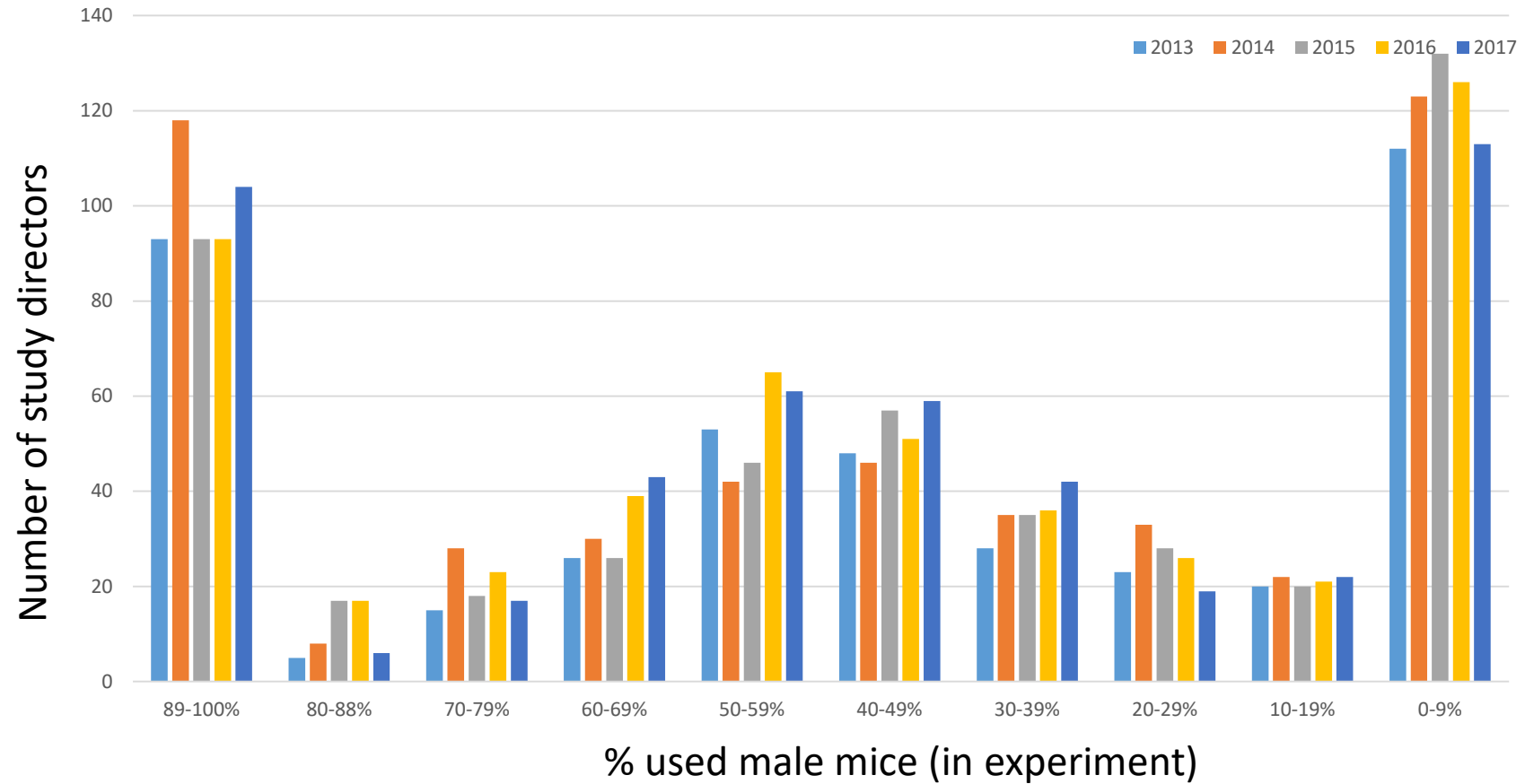
Continous Data



2,186 knockout lines

234 traits

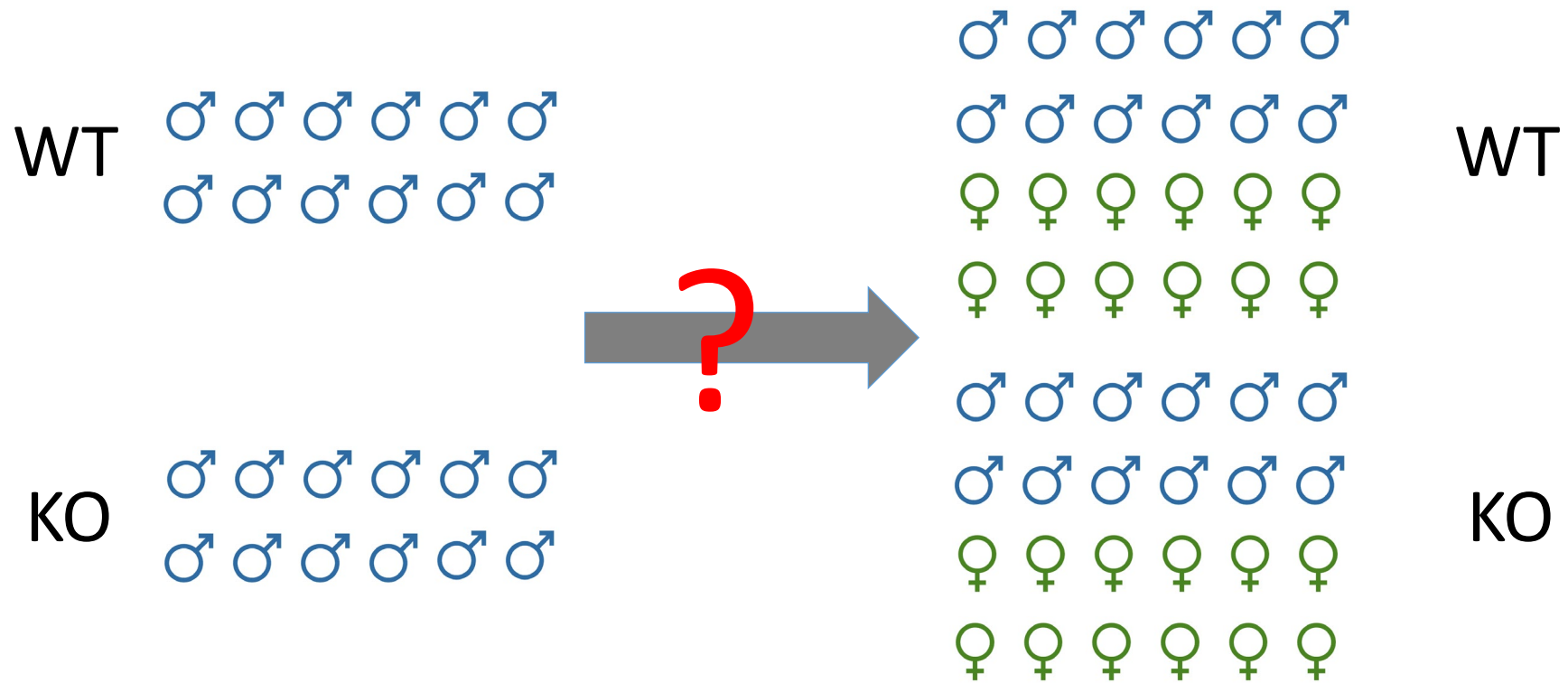
Sex of mice at a Swiss university





How do I integrate sex as a variable into my research?

Is the inclusion of both sexes irresponsible?



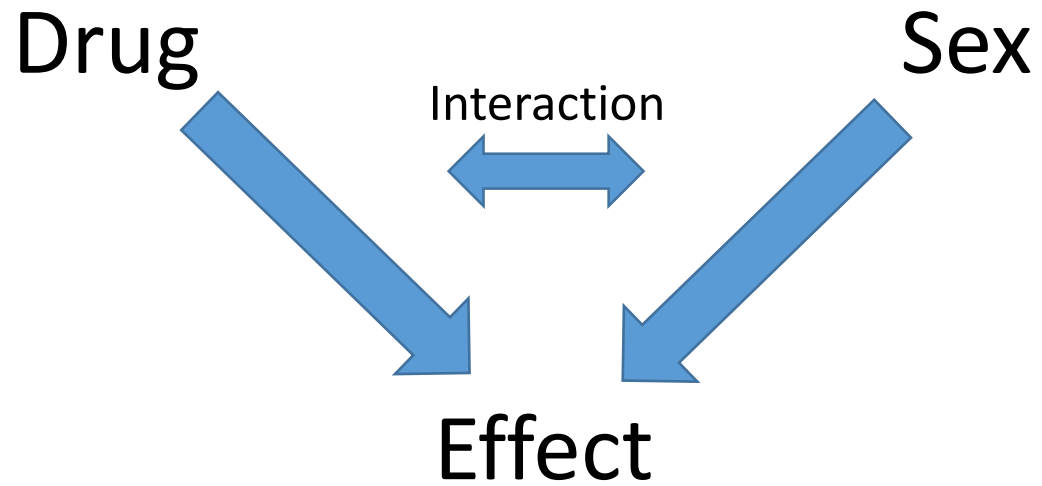
Do you think that inclusion of both sexes doubles sample size?

Factorial Design

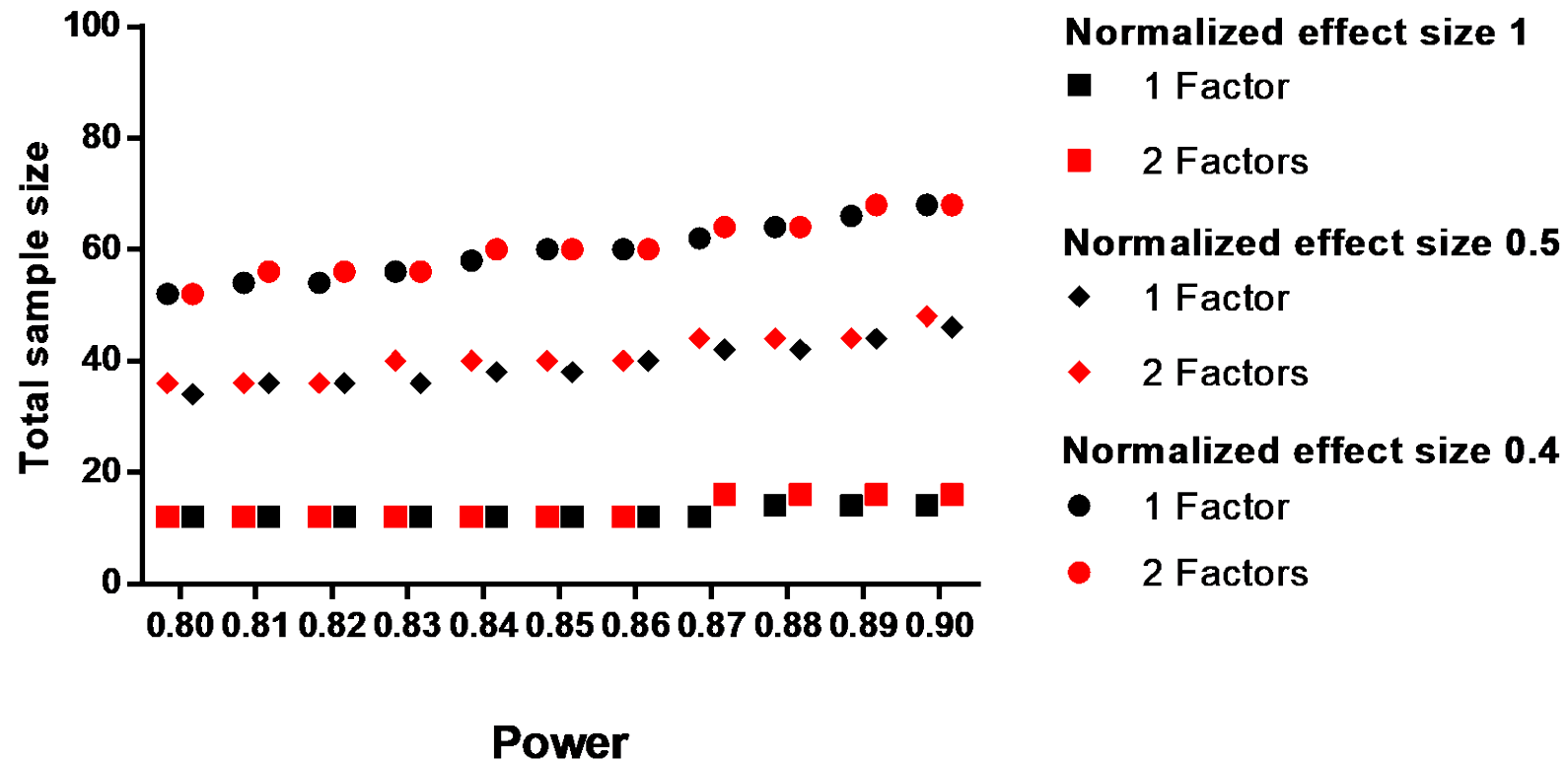


	♀	♂
No Drug	Group 1	Group 2
Drug	Group 3	Group 4

Factorial Design

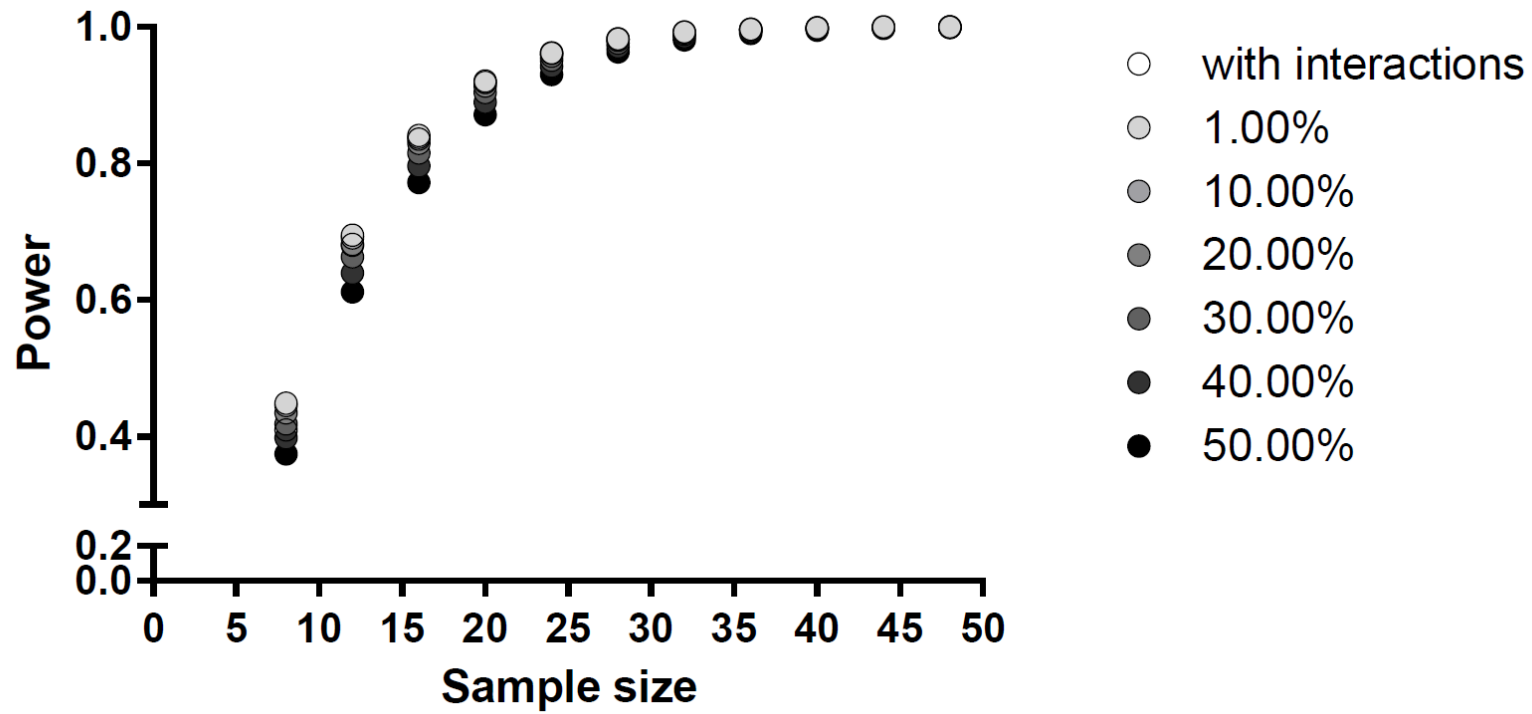


Inclusion of Sex as Confounder

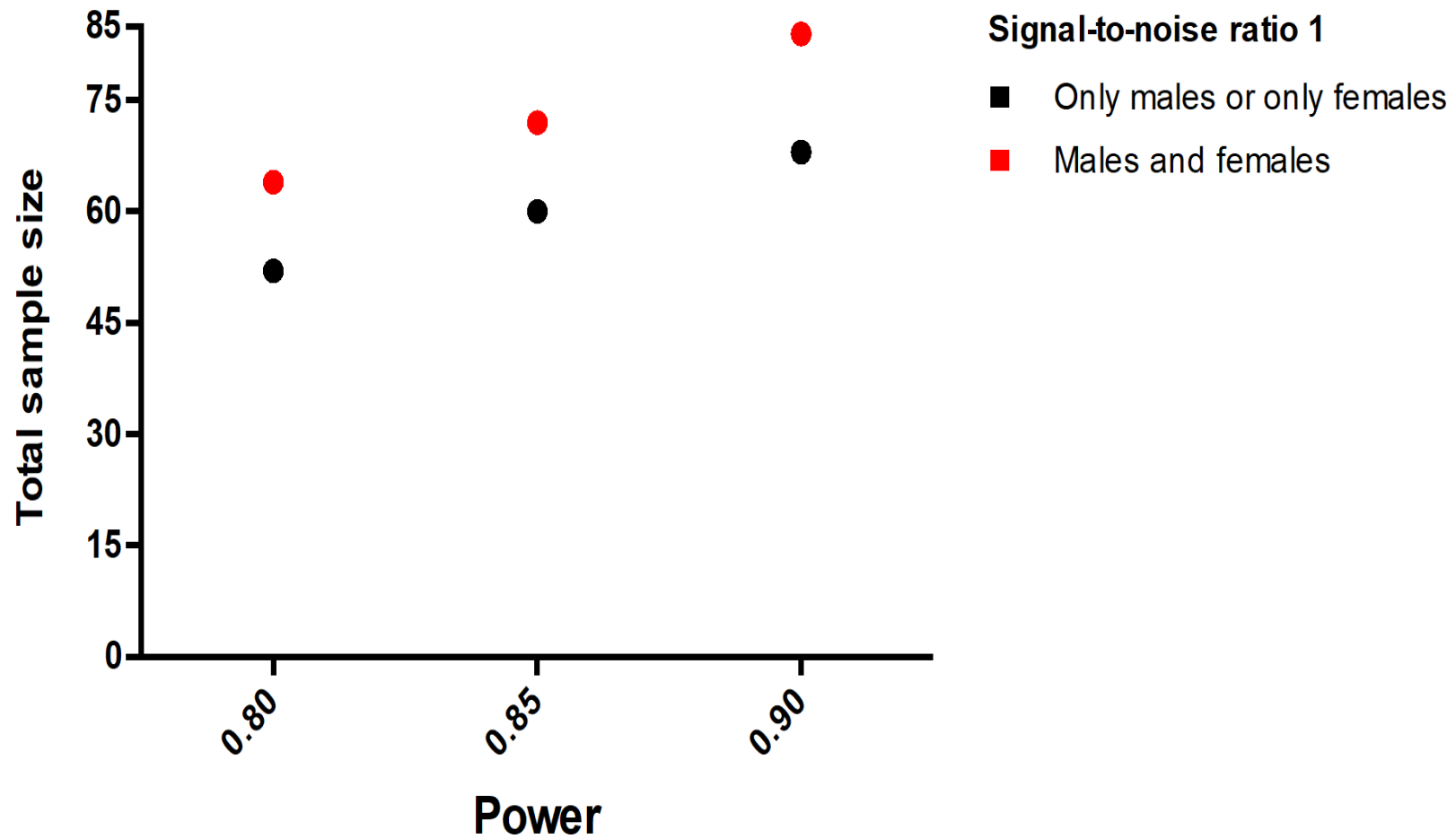


No information about sex effects is gained, sex is treated as known “noise”

Inclusion of Sex as a Variable

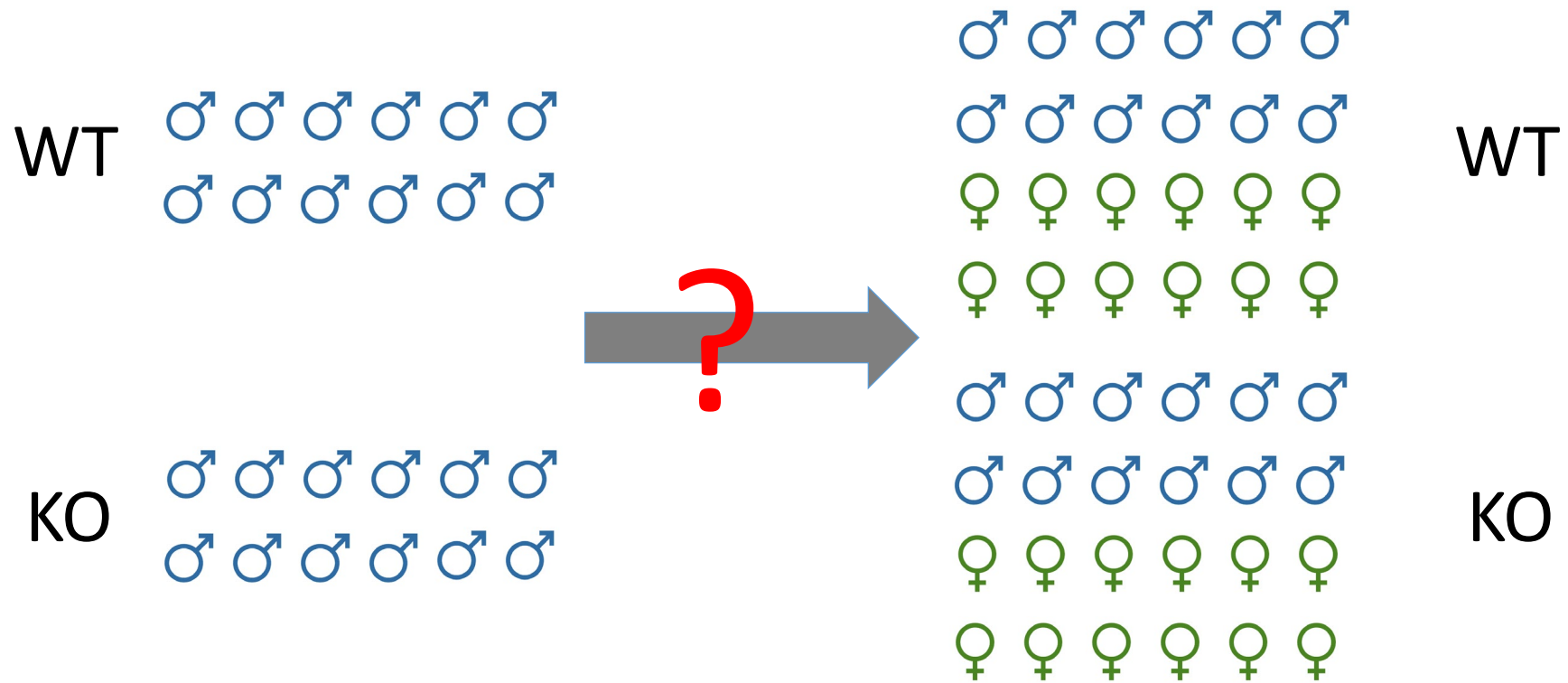


Inclusion of sex as a variable



Doubling of group sizes usually not necessary!

Is the inclusion of both sexes irresponsible?



Doubling of group sizes is NOT necessary!

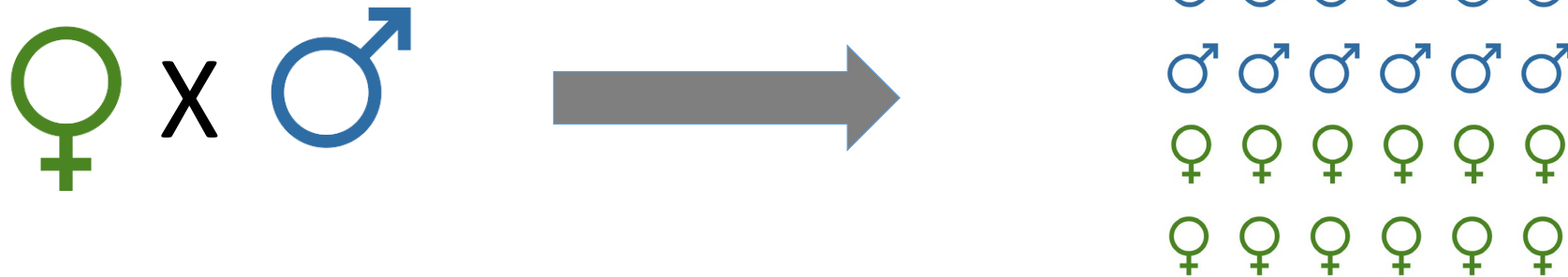


Practise work 1



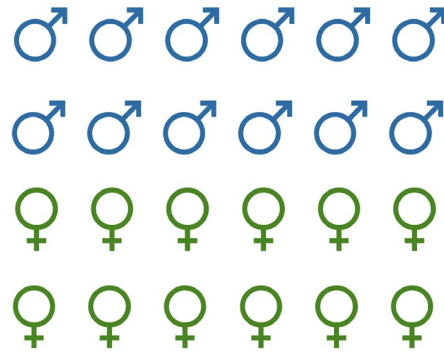
The breeding

Does it make sense to use only one sex?

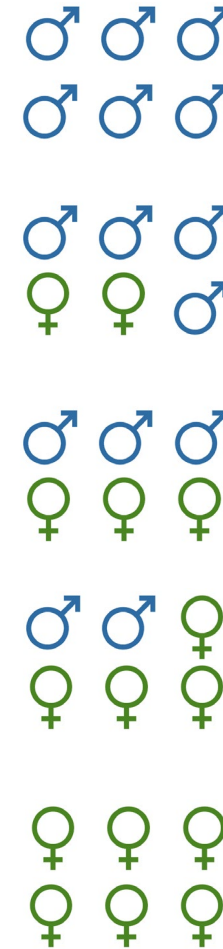
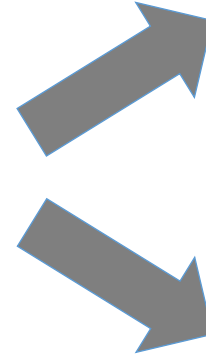


Should we use only half the pups?

Stochastic events interfere



Random
draw



Various
Different
litters

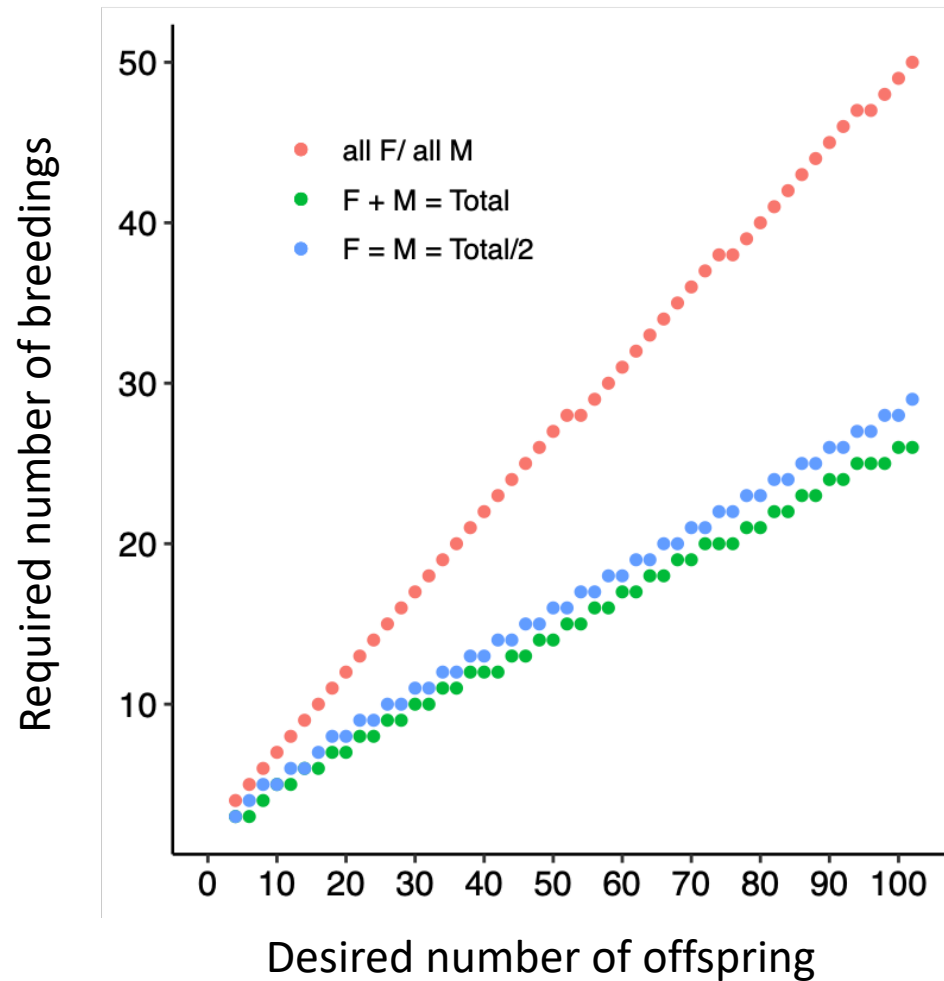
Powering breedings



90% power, both sexes required equally (M = F)

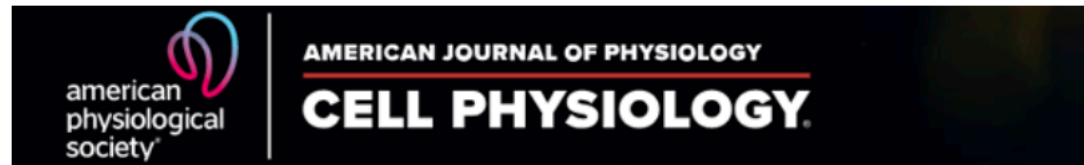
Required for experiment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Required to be born	5	8	11	13	16	18	21	23	26	28	30	33	35	37	40

Effect of use of both sexes on breedings





Cell culture



Do you know the sex of your cells?

Kalpit Shah, Charles E. McCormack, and Neil A.

Bradbury

Cell Culture

- Do you know the sex of your cell lines?
- Do you perform cell line experiments with equal use of both sexes?
- Cell line sources
 - ATCC – American Type Culture Collection
 - DSMZ – German Collection of Microorganisms and Cell Cultures

The problem is: are there equivalent male and female cell lines available?



Practise work 2

Primary cells

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Endothelial Cells

Endothelial cells form a one-cell thick walled layer called endothelium that lines all blood vessels. Do you use endothelial cells in your research? Partner with Lonza and choose from a broad collection of human primary endothelial cells from normal and diabetic type 1 and 2 donors.

Endothelial Cells

- Can be bought from many companies
- Buy cells of both sexes!
- Buy cells of multiple individuals!



Any questions?



Thank you for your attention