

Example A2:

How Many Breeding Females are Needed to Produce 20 Male Homozygotes per Week Using a Heterozygous Female x Heterozygous Male Breeding Scheme?

Strain characteristics

Breeding scheme	Heterozygotes x heterozygote
Breeding lifespan	32 weeks
Number of Litters Produced	4 litters
Litter frequency	1 litter/8 weeks (4 litters/32 weeks)
Litter size	6 pups (3 females, 3 males)
Offspring Genotypes	25% Homozygotes, 50% Heterozygotes, 25% Wild-type
Percent Useful Offspring	12.5% Homozygotes

Number of experimental mice needed

1. Number of mice needed	20
2. Age requirements If must be same age, enter 1 If can have a 2-week age range (e.g., 5-6 weeks old), enter 2 If can have a 4-week age range (e.g., 5-8 weeks old), enter 4	1
3. Frequency with which mice are needed If weekly, enter 1 If every other week, enter 2 If once a month, enter 4	1
4. Divide Line 3 by Line 2 (round to nearest whole number)	1
5. Sexes needed If both sexes needed, enter 1 If one sex needed, enter 2	2
6. Breeding scheme If homozygote x homozygote, enter 1 If heterozygote x homozygote, enter 2 If heterozygote x heterozygote, enter 4	4
7. Some surplus (insurance) mice desired If no, enter 1 If yes, enter a “fudge factor” to ensure overproduction (e.g., if 10% more mice are desired, enter 1.1)	1.1
8. Number of mice to be produced weekly Multiply Lines 1 x 4 x 5 x 6 x 7 (round to nearest whole number)	176

Colony productivity

9. Average number of pups weaned per litter	6
10. Average number of litters produced per breeder female	4
11. Average productive female’s breeding lifespan (weeks)	32
12. Calculate colony productivity Divide Line 10 by Line 11, multiply by Line 9 (round to nearest hundredth)	0.75
13. Calculate number of breeding females needed Divide Line 8 by Line 12 (round to nearest whole number)	235

Number of breeding females needed to keep colony productive

14. Calculate number of replacement breeders needed per week Divide Line 13 by Line 11 (round up to nearest whole number)	4
15. Calculate the number of additional breeders needed to provide replacement breeders Divide Line 14 by Line 12 (round up to nearest whole number)	6

Total number of breeders needed

16. Add Line 13 and Line 15 Note: Approximately 88 heterozygous females and males per week not used for experiments but useful for breeding will be produced. Therefore, breeding colony size need not be adjusted/increased to produce replacement breeders.	246
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Number of cages needed per week

17. Breeding cages For pair breeding (one breeding female per cage): – 235 cages needed or trio breeding (two breeding females per cage): – 118 cages needed	
18. Weaning cages ~11 females & ~11 males weaned per week will require ~ 6 cages (5 animals per cage separated by sex)	