

Power Analysis

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Power analysis

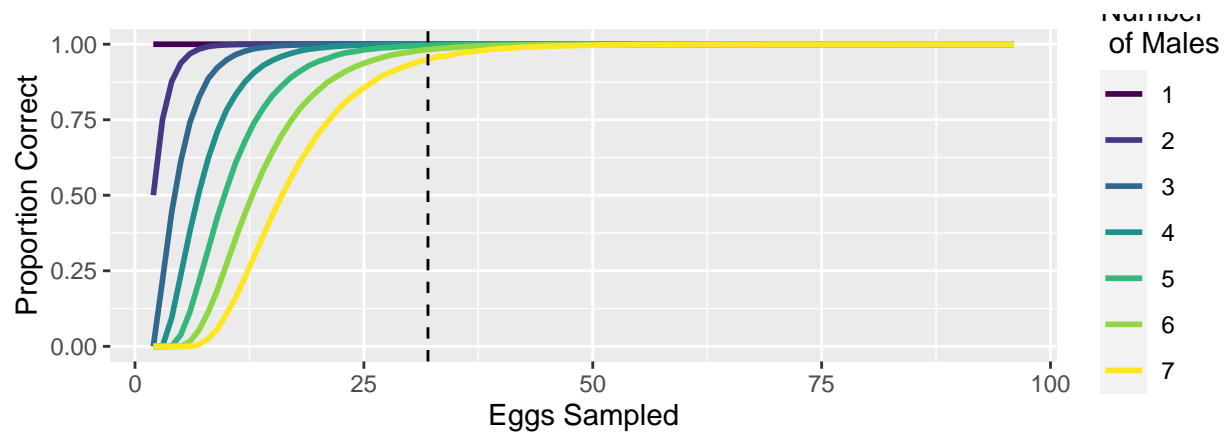
Question 1: How many hatchlings should be sampled from a nest to robustly estimate the number of males that contributed to it?

assuming random fertilization

```
source('code/eggs_to_sample.R')

eggs_to_sample(n_eggs = 100, max_hatchlings = 96, max_males = 7,
               breeding = 'random', n_sims = 100000)
```

```
## [[1]]
```



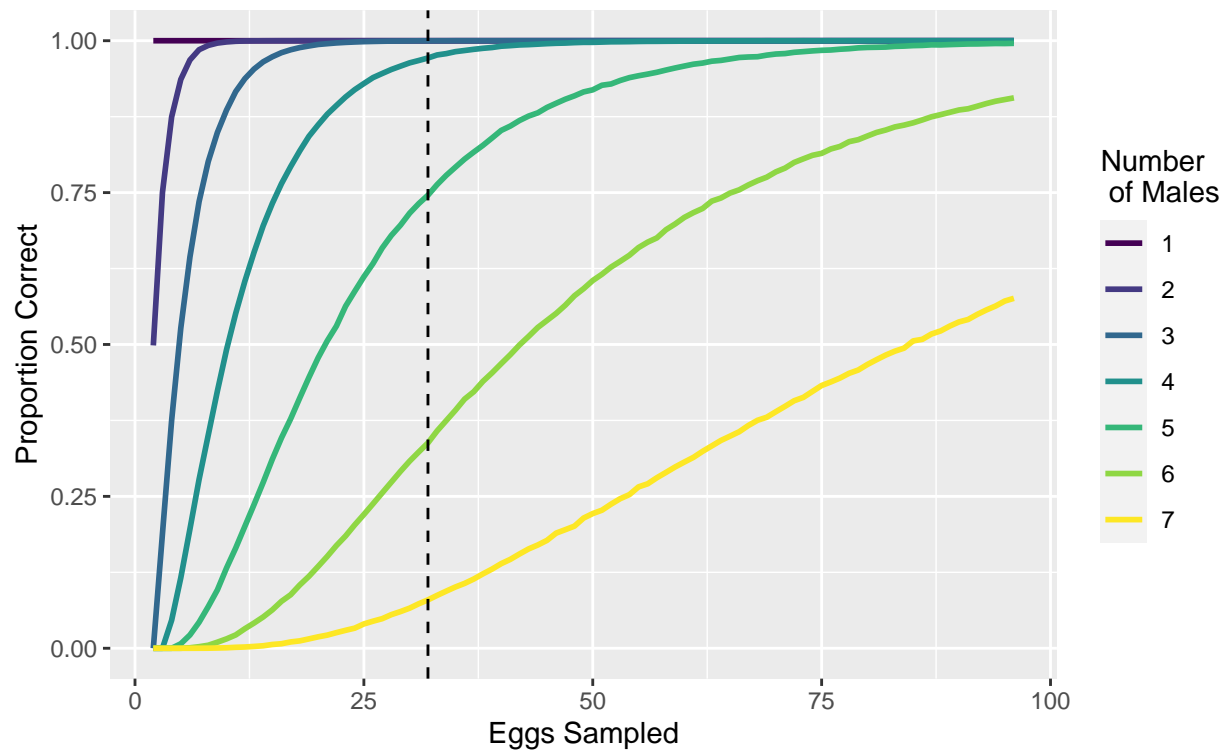
```
##
## [[2]]
##   Number of Males Confidence
## 1                1    1.00000
## 2                2    1.00000
## 3                3    0.99999
## 4                4    0.99959
## 5                5    0.99592
## 6                6    0.98217
## 7                7    0.95044
```

assuming exponential decay in fertilization ($1/2$, $1/4$, $1/8$, etc.)

```
source('code/eggs_to_sample.R')

eggs_to_sample(n_eggs = 100,
               max_hatchlings = 96,
               max_males = 7,
               breeding = 'exponential',
               n_sims = 100000)
```

```
## [[1]]
```



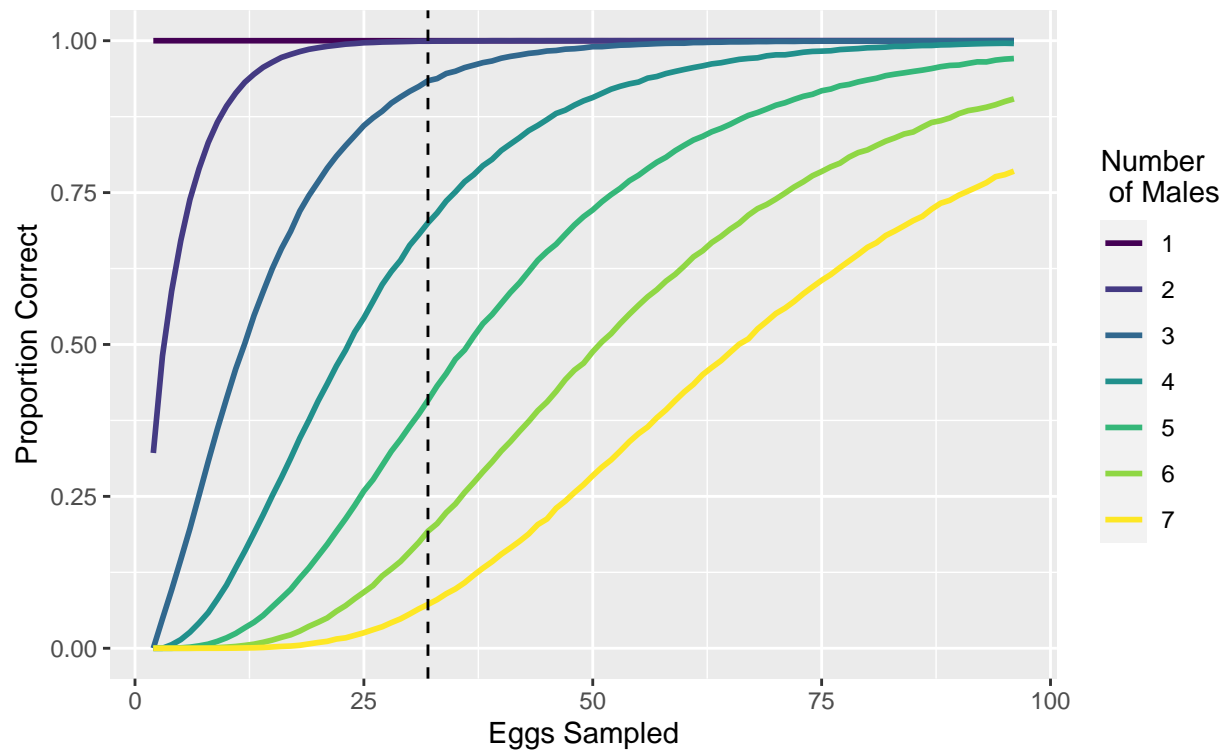
```
##
## [[2]]
##   Number of Males Confidence
## 1                1    1.00000
## 2                2    1.00000
## 3                3    0.99983
## 4                4    0.97155
## 5                5    0.74575
## 6                6    0.33800
## 7                7    0.07961
```

assuming one dominant sire

```
source('code/eggs_to_sample.R')

eggs_to_sample(n_eggs = 100,
               max_hatchlings = 96,
               max_males = 7,
               breeding = 'dominate',
               n_sims = 100000)
```

```
## [[1]]
```



```
##
## [[2]]
##   Number of Males Confidence
## 1                1    1.00000
## 2                2    0.99917
## 3                3    0.93414
## 4                4    0.70015
## 5                5    0.40803
## 6                6    0.19263
## 7                7    0.07217
```

Question 2: How many females and nests should be sampled to get a robust estimate of the number of breeding males, and therefore the breeding sex ratio?