Becker et al.(2022) experiment reproduction

Reference experiment figure 2. page 9 (Becker et al. (2022))

Parameter settings

- day.max <- 21
- n_sim <- 100
- farm_size <- 1
- farm_density <- 20
- target_weight <- 2
- prevalence <- 0.5

Plots

```
## Plot for average Within flock prevalence
plot_qoi(
  data     = output_avg,
  qoi      = output_avg[, 2],
  ci_lower = ci.lower[, 2],
  ci_upper = ci.upper[, 2],
  title    = "Average flock prevalence",
  subtitle = paste(dim(parallel_output)[3], "simulations"),
  xlab     = "Days",
  ylab     = "Proportion of infected broilers"
)
```
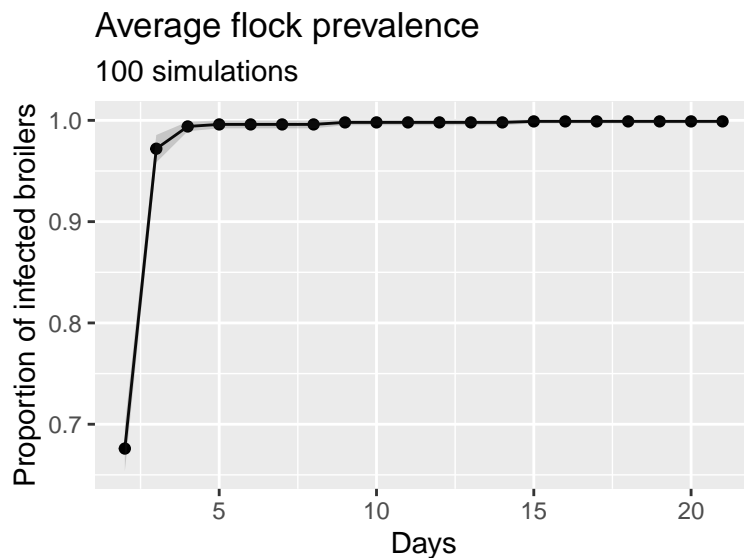
```
## Plot for average (over broilers + iterations) excreted bacteria
plot_qoi(
  data     = output_avg,
  qoi      = log10(output_avg[, 3]),
  ci_lower = log10(ci.lower[, 3]),
  ci_upper = log10(ci.upper[, 3]),
  title    = "Average Bacterial concentration in excreted feces",
  subtitle = paste(dim(parallel_output)[3], "simulations"),
  xlab     = "Days",
  ylab     = "ESBL E. coli (log10 CFU/g)"
)
```

Average Bacterial concentration in excreted fe
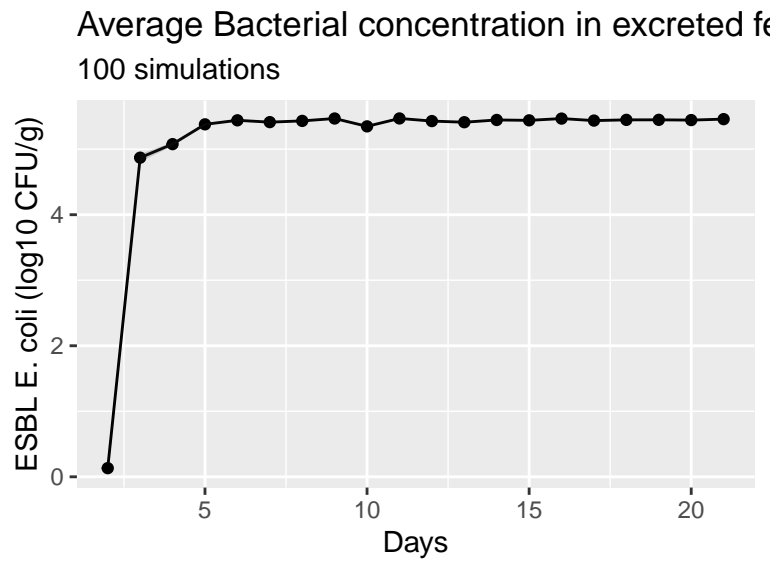
100 simulations


```
## Plot for amount of litter + feces
plot_qoi(
  data     = output_avg,
  qoi      = (output_avg[, 4]+inputs$litter_mass)/1000,
  ci_lower = NA,
  ci_upper = NA,
  title    = "Mass of litter + feces",
  subtitle = paste(dim(parallel_output)[3], "simulations"),
  xlab     = "Days",
  ylab     = "pen mass (kg)"
)
```
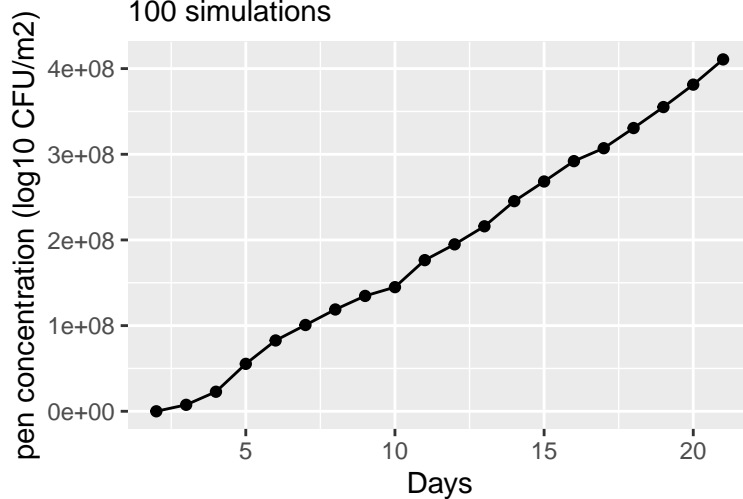
Mass of litter + feces
100 simulations
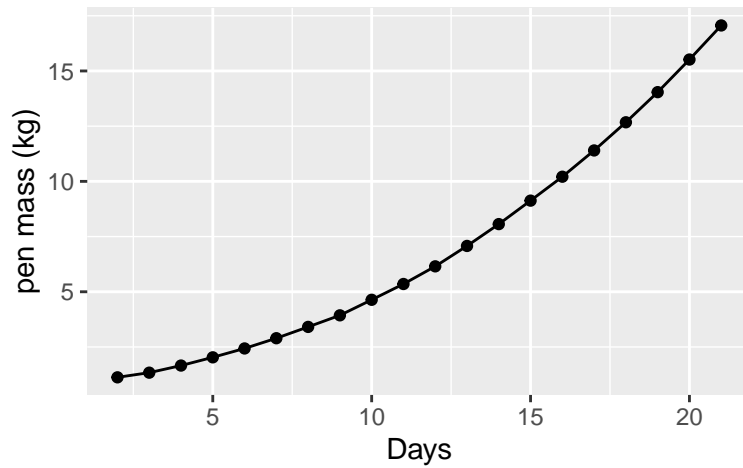

```
## Plot for number of bacteria per sq. meter
plot_qoi(
  data     = output_avg,
  qoi      = output_avg[, 1]/inputs$farm_size,
  ci_lower = NA,
  ci_upper = NA,
  title    = "Concentration in bacteria in farm",
  subtitle = paste(dim(parallel_output)[3], "simulations"),
  xlab     = "Days",
  ylab     = "pen concentration (log10 CFU/m2)"
)
```

Concentration in bacteria in farm
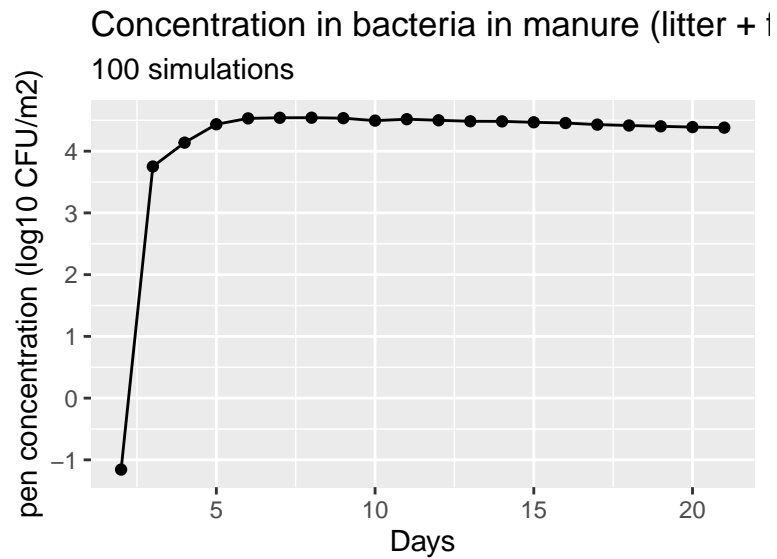### 100 simulations


```
## Plot for number of bacteria per g of pen mass
plot_qoi(
  data     = output_avg,
```

```
  qoi       = log10(output_avg[, 1]/(output_avg[, 4]+inputs$litter_mass)),
  ci_lower = NA,
  ci_upper = NA,
  title    = "Concentration in bacteria in manure (litter + feces)",
  subtitle = paste(dim(parallel_output)[3], "simulations"),
  xlab     = "Days",
  ylab     = "pen concentration (log10 CFU/m2)"
)
```
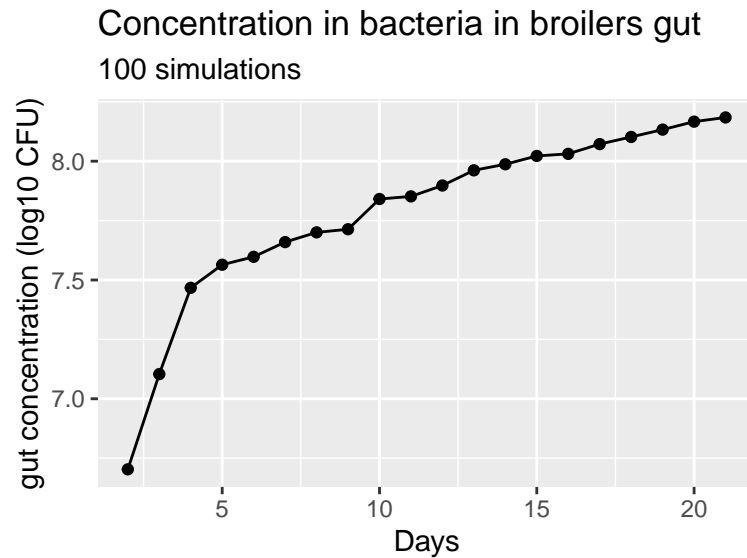
Concentration in bacteria in manure (litter + f
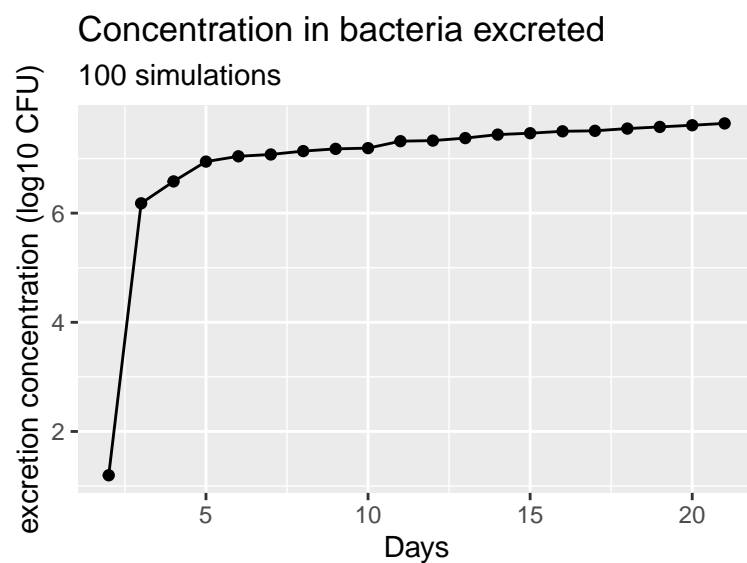


```
## Plot for average number of bacteria in the broiler's gut
plot_qoi(
  data     = output_avg,
  qoi      = log10(output_avg[, 5]),
  ci_lower = NA,
  ci_upper = NA,
  title    = "Concentration in bacteria in broilers gut",
  subtitle = paste(dim(parallel_output)[3], "simulations"),
  xlab     = "Days",
  ylab     = "gut concentration (log10 CFU)"
)
```

Concentration in bacteria in broilers gut
100 simulations


```
## Plot for average number of bacteria excreted
plot_qoi(
  data     = output_avg,
  qoi      = log10(output_avg[, 6]),
  ci_lower = NA,
  ci_upper = NA,
  title    = "Concentration in bacteria excreted",
  subtitle = paste(dim(parallel_output)[3], "simulations"),
  xlab     = "Days",
  ylab     = "excretion concentration (log10 CFU)"
)
```

Concentration in bacteria excreted
100 simulations


```
## Plot for average number of bacteria ingested
plot_qoi(
  data     = output_avg,
```

```
  qoi      = log10(output_avg[, 7]),
  ci_lower = NA,
  ci_upper = NA,
  title    = "Concentration in bacteria ingested",
  subtitle = paste(dim(parallel_output)[3], "simulations"),
  xlab     = "Days",
  ylab     = "ingestion concentration (log10 CFU)"
)
```

Concentration in bacteria ingested

100 simulations