Data Manipulation

This document will show how to *manipulate* data.

Import the two datasets that we are going to manipulate.

```
litters_df =
  read_csv("data/FAS_litters.csv", na = c("NA", "", "."))
```

```
## Rows: 49 Columns: 8
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (2): Group, Litter Number
## dbl (6): GD0 weight, GD18 weight, GD of Birth, Pups born alive, Pups dead @ ...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
litters_df = janitor::clean_names(litters_df)

pups_df =
  read_csv("data/FAS_pups.csv", na=c("NA", "", "."))
```

```
## Rows: 313 Columns: 6
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (1): Litter Number
## dbl (5): Sex, PD ears, PD eyes, PD pivot, PD walk
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
pups_df = janitor::clean_names(pups_df)
```

select

Use `select` to select variables

```
select(litters_df, group, litter_number, gd0_weight)
```

df variables selected

```
## # A tibble: 49 x 3
##    group litter_number   gd0_weight
##    <chr> <chr>                <dbl>
##  1 Con7  #85                   19.7
##  2 Con7  #1/2/95/2             27
```

```
##  3 Con7  #5/5/3/83/3-3         26
##  4 Con7  #5/4/2/95/2           28.5
##  5 Con7  #4/2/95/3-3           NA
##  6 Con7  #2/2/95/3-2           NA
##  7 Con7  #1/5/3/83/3-3/2       NA
##  8 Con8  #3/83/3-3             NA
##  9 Con8  #2/95/3               NA
## 10 Con8  #3/5/2/2/95           28.5
## # i 39 more rows
```

```
select(litters_df, group:gd18_weight)
```

```
## # A tibble: 49 x 4
##    group litter_number   gd0_weight gd18_weight
##    <chr> <chr>                <dbl>       <dbl>
##  1 Con7  #85                   19.7        34.7
##  2 Con7  #1/2/95/2             27          42
##  3 Con7  #5/5/3/83/3-3         26          41.4
##  4 Con7  #5/4/2/95/2           28.5        44.1
##  5 Con7  #4/2/95/3-3           NA          NA
##  6 Con7  #2/2/95/3-2           NA          NA
##  7 Con7  #1/5/3/83/3-3/2       NA          NA
##  8 Con8  #3/83/3-3             NA          NA
##  9 Con8  #2/95/3               NA          NA
## 10 Con8  #3/5/2/2/95           28.5        NA
## # i 39 more rows
```

```
select(litters_df, -pups_survive)
```

w/o this variable

```
## # A tibble: 49 x 7
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                   19.7        34.7          20               3
##  2 Con7  #1/2/95/2             27          42            19               8
##  3 Con7  #5/5/3/83/3-3         26          41.4          19               6
##  4 Con7  #5/4/2/95/2           28.5        44.1          19               5
##  5 Con7  #4/2/95/3-3           NA          NA            20               6
##  6 Con7  #2/2/95/3-2           NA          NA            20               6
##  7 Con7  #1/5/3/83/3-3/2       NA          NA            20               9
##  8 Con8  #3/83/3-3             NA          NA            20               9
##  9 Con8  #2/95/3               NA          NA            20               8
## 10 Con8  #3/5/2/2/95           28.5        NA            20               8
## # i 39 more rows
## # i 1 more variable: pups_dead_birth <dbl>
```

```
select(litters_df, -(group:gd18_weight))
```

```
## # A tibble: 49 x 4
##    gd_of_birth pups_born_alive pups_dead_birth pups_survive
##          <dbl>           <dbl>           <dbl>        <dbl>
##  1          20               3               4            3
##  2          19               8               0            7
```

```
##  3          19                6               0            5
##  4          19                5               1            4
##  5          20                6               0            6
##  6          20                6               0            4
##  7          20                9               0            9
##  8          20                9               1            8
##  9          20                8               0            8
## 10          20                8               0            8
## # i 39 more rows
```

```
select(litters_df, starts_with("gd"))
```

```
## # A tibble: 49 x 3
##    gd0_weight gd18_weight gd_of_birth
##         <dbl>       <dbl>       <dbl>
##  1       19.7        34.7          20
##  2       27          42            19
##  3       26          41.4          19
##  4       28.5        44.1          19
##  5       NA          NA            20
##  6       NA          NA            20
##  7       NA          NA            20
##  8       NA          NA            20
##  9       NA          NA            20
## 10       28.5        NA            20
## # i 39 more rows
```

```
select(litters_df, contains("pups"))
```

```
## # A tibble: 49 x 3
##    pups_born_alive pups_dead_birth pups_survive
##              <dbl>           <dbl>        <dbl>
##  1               3               4            3
##  2               8               0            7
##  3               6               0            5
##  4               5               1            4
##  5               6               0            6
##  6               6               0            4
##  7               9               0            9
##  8               9               1            8
##  9               8               0            8
## 10               8               0            8
## # i 39 more rows
```

```
select(litters_df, GROUP = group)
```

```
## # A tibble: 49 x 1
##    GROUP
##    <chr>
##  1 Con7
##  2 Con7
##  3 Con7
```

```
##  4 Con7
##  5 Con7
##  6 Con7
##  7 Con7
##  8 Con8
##  9 Con8
## 10 Con8
## # i 39 more rows
```

select(): only selected
rename(): everything & renamed

```
rename(litters_df, GROUP = group)
```

```
## # A tibble: 49 x 8
##    GROUP litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                   19.7        34.7          20               3
##  2 Con7  #1/2/95/2             27          42            19               8
##  3 Con7  #5/5/3/83/3-3         26          41.4          19               6
##  4 Con7  #5/4/2/95/2           28.5        44.1          19               5
##  5 Con7  #4/2/95/3-3           NA          NA            20               6
##  6 Con7  #2/2/95/3-2           NA          NA            20               6
##  7 Con7  #1/5/3/83/3-3/2       NA          NA            20               9
##  8 Con8  #3/83/3-3             NA          NA            20               9
##  9 Con8  #2/95/3               NA          NA            20               8
## 10 Con8  #3/5/2/2/95           28.5        NA            20               8
## # i 39 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
select(litters_df, litter_number, gd0_weight, everything())
```

```
## # A tibble: 49 x 8
##    litter_number   gd0_weight group gd18_weight gd_of_birth pups_born_alive
##    <chr>                <dbl> <chr>       <dbl>       <dbl>           <dbl>
##  1 #85                   19.7 Con7         34.7          20               3
##  2 #1/2/95/2             27   Con7         42            19               8
##  3 #5/5/3/83/3-3         26   Con7         41.4          19               6
##  4 #5/4/2/95/2           28.5 Con7         44.1          19               5
##  5 #4/2/95/3-3           NA   Con7         NA            20               6
##  6 #2/2/95/3-2           NA   Con7         NA            20               6
##  7 #1/5/3/83/3-3/2       NA   Con7         NA            20               9
##  8 #3/83/3-3             NA   Con8         NA            20               9
##  9 #2/95/3               NA   Con8         NA            20               8
## 10 #3/5/2/2/95           28.5 Con8         NA            20               8
## # i 39 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
relocate(litters_df, litter_number, gd0_weight)
```

& the rest in order as before

```
## # A tibble: 49 x 8
##    litter_number   gd0_weight group gd18_weight gd_of_birth pups_born_alive
##    <chr>                <dbl> <chr>       <dbl>       <dbl>           <dbl>
##  1 #85                   19.7 Con7         34.7          20               3
##  2 #1/2/95/2             27   Con7         42            19               8
```

```
##  3 #5/5/3/83/3-3         26   Con7         41.4          19               6
##  4 #5/4/2/95/2           28.5 Con7         44.1          19               5
##  5 #4/2/95/3-3           NA   Con7         NA            20               6
##  6 #2/2/95/3-2           NA   Con7         NA            20               6
##  7 #1/5/3/83/3-3/2       NA   Con7         NA            20               9
##  8 #3/83/3-3             NA   Con8         NA            20               9
##  9 #2/95/3               NA   Con8         NA            20               8
## 10 #3/5/2/2/95           28.5 Con8         NA            20               8
## # i 39 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
select(pups_df, litter_number, sex, pd_ears)
```

```
## # A tibble: 313 x 3
##    litter_number   sex pd_ears
##    <chr>         <dbl>   <dbl>
##  1 #85               1       4
##  2 #85               1       4
##  3 #1/2/95/2         1       5
##  4 #1/2/95/2         1       5
##  5 #5/5/3/83/3-3     1       5
##  6 #5/5/3/83/3-3     1       5
##  7 #5/4/2/95/2       1      NA
##  8 #4/2/95/3-3       1       4
##  9 #4/2/95/3-3       1       4
## 10 #2/2/95/3-2       1       4
## # i 303 more rows
```

filter

filtering out rows.

```
filter(litters_df, gd_of_birth == 20)
```

```
## # A tibble: 32 x 8
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                   19.7        34.7          20               3
##  2 Con7  #4/2/95/3-3            NA          NA           20               6
##  3 Con7  #2/2/95/3-2            NA          NA           20               6
##  4 Con7  #1/5/3/83/3-3/2        NA          NA           20               9
##  5 Con8  #3/83/3-3              NA          NA           20               9
##  6 Con8  #2/95/3                NA          NA           20               8
##  7 Con8  #3/5/2/2/95            28.5        NA           20               8
##  8 Con8  #1/6/2/2/95-2          NA          NA           20               7
##  9 Con8  #3/5/3/83/3-3-2        NA          NA           20               8
## 10 Con8  #3/6/2/2/95-3          NA          NA           20               7
## # i 22 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```r
filter(litters_df, gd_of_birth == 19)
```

```
## # A tibble: 17 x 8
##    group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>              <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #1/2/95/2           27          42            19               8
##  2 Con7  #5/5/3/83/3-3       26          41.4          19               6
##  3 Con7  #5/4/2/95/2         28.5        44.1          19               5
##  4 Con8  #5/4/3/83/3         28          NA            19               9
##  5 Con8  #2/2/95/2           NA          NA            19               5
##  6 Mod7  #59                 17          33.4          19               8
##  7 Mod7  #103                21.4        42.1          19               9
##  8 Mod7  #1/82/3-2           NA          NA            19               6
##  9 Mod7  #3/83/3-2           NA          NA            19               8
## 10 Mod7  #4/2/95/2           23.5        NA            19               9
## 11 Mod7  #5/3/83/5-2         22.6        37            19               5
## 12 Mod7  #94/2               24.4        42.9          19               7
## 13 Mod7  #62                 19.5        35.9          19               7
## 14 Low7  #112                23.9        40.5          19               6
## 15 Mod8  #5/93/2             NA          NA            19               8
## 16 Mod8  #7/110/3-2          27.5        46            19               8
## 17 Low8  #79                 25.4        43.8          19               8
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```r
filter(litters_df, pups_born_alive > 8)
```

```
## # A tibble: 12 x 8
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #1/5/3/83/3-3/2       NA          NA            20               9
##  2 Con8  #3/83/3-3             NA          NA            20               9
##  3 Con8  #5/4/3/83/3           28          NA            19               9
##  4 Mod7  #103                  21.4        42.1          19               9
##  5 Mod7  #4/2/95/2             23.5        NA            19               9
##  6 Mod7  #8/110/3-2            NA          NA            20               9
##  7 Low7  #107                  22.6        42.4          20               9
##  8 Low7  #98                   23.8        43.8          20               9
##  9 Low7  #102                  22.6        43.3          20              11
## 10 Low7  #101                  23.8        42.7          20               9
## 11 Mod8  #5/93                 NA          41.1          20              11
## 12 Mod8  #2/95/2               28.5        44.5          20               9
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```r
filter(litters_df, pups_born_alive >= 8)
```

```
## # A tibble: 28 x 8
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #1/2/95/2             27          42            19               8
##  2 Con7  #1/5/3/83/3-3/2       NA          NA            20               9
##  3 Con8  #3/83/3-3             NA          NA            20               9
```

```
##  4 Con8  #2/95/3               NA          NA            20               8
##  5 Con8  #3/5/2/2/95           28.5        NA            20               8
##  6 Con8  #5/4/3/83/3           28          NA            19               9
##  7 Con8  #3/5/3/83/3-3-2       NA          NA            20               8
##  8 Mod7  #59                   17          33.4          19               8
##  9 Mod7  #103                  21.4        42.1          19               9
## 10 Mod7  #3/83/3-2             NA          NA            19               8
## # i 18 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
filter(litters_df, pups_born_alive != 9)
```

```
## # A tibble: 39 x 8
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                   19.7        34.7          20               3
##  2 Con7  #1/2/95/2             27          42            19               8
##  3 Con7  #5/5/3/83/3-3         26          41.4          19               6
##  4 Con7  #5/4/2/95/2           28.5        44.1          19               5
##  5 Con7  #4/2/95/3-3           NA          NA            20               6
##  6 Con7  #2/2/95/3-2           NA          NA            20               6
##  7 Con8  #2/95/3               NA          NA            20               8
##  8 Con8  #3/5/2/2/95           28.5        NA            20               8
##  9 Con8  #1/6/2/2/95-2         NA          NA            20               7
## 10 Con8  #3/5/3/83/3-3-2       NA          NA            20               8
## # i 29 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
filter(litters_df, group == "Low8")
```

```
## # A tibble: 7 x 8
##   group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##   <chr> <chr>              <dbl>       <dbl>       <dbl>           <dbl>
## 1 Low8  #53                 21.8        37.2          20               8
## 2 Low8  #79                 25.4        43.8          19               8
## 3 Low8  #100                20          39.2          20               8
## 4 Low8  #4/84               21.8        35.2          20               4
## 5 Low8  #108                25.6        47.5          20               8
## 6 Low8  #99                 23.5        39            20               6
## 7 Low8  #110                25.5        42.7          20               7
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
filter(litters_df, group %in% c("Low7", "Low8"))
```

in both ?

```
## # A tibble: 15 x 8
##    group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>              <dbl>       <dbl>       <dbl>           <dbl>
##  1 Low7  #84/2               24.3        40.8          20               8
##  2 Low7  #107                22.6        42.4          20               9
##  3 Low7  #85/2               22.2        38.5          20               8
##  4 Low7  #98                 23.8        43.8          20               9
##  5 Low7  #102                22.6        43.3          20              11
```

```
##  6 Low7  #101                23.8        42.7          20               9
##  7 Low7  #111                25.5        44.6          20               3
##  8 Low7  #112                23.9        40.5          19               6
##  9 Low8  #53                 21.8        37.2          20               8
## 10 Low8  #79                 25.4        43.8          19               8
## 11 Low8  #100                20          39.2          20               8
## 12 Low8  #4/84               21.8        35.2          20               4
## 13 Low8  #108                25.6        47.5          20               8
## 14 Low8  #99                 23.5        39            20               6
## 15 Low8  #110                25.5        42.7          20               7
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
filter(litters_df, group %in% c("Low7", "Low8"), pups_born_alive ==8)
```

```
## # A tibble: 6 x 8
##   group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##   <chr> <chr>              <dbl>       <dbl>       <dbl>           <dbl>
## 1 Low7  #84/2               24.3        40.8          20               8
## 2 Low7  #85/2               22.2        38.5          20               8
## 3 Low8  #53                 21.8        37.2          20               8
## 4 Low8  #79                 25.4        43.8          19               8
## 5 Low8  #100                20          39.2          20               8
## 6 Low8  #108                25.6        47.5          20               8
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
drop_na(litters_df)
```

```
## # A tibble: 31 x 8
##    group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>              <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                 19.7        34.7          20               3
##  2 Con7  #1/2/95/2           27          42            19               8
##  3 Con7  #5/5/3/83/3-3       26          41.4          19               6
##  4 Con7  #5/4/2/95/2         28.5        44.1          19               5
##  5 Mod7  #59                 17          33.4          19               8
##  6 Mod7  #103                21.4        42.1          19               9
##  7 Mod7  #3/82/3-2           28          45.9          20               5
##  8 Mod7  #5/3/83/5-2         22.6        37            19               5
##  9 Mod7  #106                21.7        37.8          20               5
## 10 Mod7  #94/2               24.4        42.9          19               7
## # i 21 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
drop_na(litters_df, gd0_weight)
```

```
## # A tibble: 34 x 8
##    group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>              <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                 19.7        34.7          20               3
##  2 Con7  #1/2/95/2           27          42            19               8
##  3 Con7  #5/5/3/83/3-3       26          41.4          19               6
##  4 Con7  #5/4/2/95/2         28.5        44.1          19               5
```

```
##  5 Con8  #3/5/2/2/95         28.5        NA            20               8
##  6 Con8  #5/4/3/83/3         28          NA            19               9
##  7 Mod7  #59                 17          33.4          19               8
##  8 Mod7  #103                21.4        42.1          19               9
##  9 Mod7  #3/82/3-2           28          45.9          20               5
## 10 Mod7  #4/2/95/2           23.5        NA            19               9
## # i 24 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
filter(pups_df, sex == 1)
```

```
## # A tibble: 155 x 6
##    litter_number   sex pd_ears pd_eyes pd_pivot pd_walk
##    <chr>         <dbl>   <dbl>   <dbl>    <dbl>   <dbl>
##  1 #85               1       4      13        7      11
##  2 #85               1       4      13        7      12
##  3 #1/2/95/2         1       5      13        7       9
##  4 #1/2/95/2         1       5      13        8      10
##  5 #5/5/3/83/3-3     1       5      13        8      10
##  6 #5/5/3/83/3-3     1       5      14        6       9
##  7 #5/4/2/95/2       1      NA      14        5       9
##  8 #4/2/95/3-3       1       4      13        6       8
##  9 #4/2/95/3-3       1       4      13        7       9
## 10 #2/2/95/3-2       1       4      NA        8      10
## # i 145 more rows
```

```
filter(pups_df, pd_walk < 11, sex == 2)
```

```
## # A tibble: 127 x 6
##    litter_number   sex pd_ears pd_eyes pd_pivot pd_walk
##    <chr>         <dbl>   <dbl>   <dbl>    <dbl>   <dbl>
##  1 #1/2/95/2         2       4      13        7       9
##  2 #1/2/95/2         2       4      13        7      10
##  3 #1/2/95/2         2       5      13        8      10
##  4 #1/2/95/2         2       5      13        8      10
##  5 #1/2/95/2         2       5      13        6      10
##  6 #5/5/3/83/3-3     2       5      13        8      10
##  7 #5/5/3/83/3-3     2       5      14        7      10
##  8 #5/5/3/83/3-3     2       5      14        8      10
##  9 #5/4/2/95/2       2      NA      14        7      10
## 10 #5/4/2/95/2       2      NA      14        7      10
## # i 117 more rows
```

mutate

add this additional variable

```
mutate(litters_df, wt_gain = gd18_weight - gd0_weight)
```

```
## # A tibble: 49 x 9
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
```

```
##  1 Con7  #85                  19.7        34.7          20               3
##  2 Con7  #1/2/95/2             27          42            19               8
##  3 Con7  #5/5/3/83/3-3         26          41.4          19               6
##  4 Con7  #5/4/2/95/2           28.5        44.1          19               5
##  5 Con7  #4/2/95/3-3           NA          NA            20               6
##  6 Con7  #2/2/95/3-2           NA          NA            20               6
##  7 Con7  #1/5/3/83/3-3/2       NA          NA            20               9
##  8 Con8  #3/83/3-3             NA          NA            20               9
##  9 Con8  #2/95/3               NA          NA            20               8
## 10 Con8  #3/5/2/2/95           28.5        NA            20               8
## # i 39 more rows
## # i 3 more variables: pups_dead_birth <dbl>, pups_survive <dbl>, wt_gain <dbl>
```

```
mutate(litters_df, sq_pups = pups_born_alive^2)
```

```
## # A tibble: 49 x 9
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                   19.7        34.7          20               3
##  2 Con7  #1/2/95/2              27          42            19               8
##  3 Con7  #5/5/3/83/3-3          26          41.4          19               6
##  4 Con7  #5/4/2/95/2            28.5        44.1          19               5
##  5 Con7  #4/2/95/3-3            NA          NA            20               6
##  6 Con7  #2/2/95/3-2            NA          NA            20               6
##  7 Con7  #1/5/3/83/3-3/2        NA          NA            20               9
##  8 Con8  #3/83/3-3              NA          NA            20               9
##  9 Con8  #2/95/3                NA          NA            20               8
## 10 Con8  #3/5/2/2/95            28.5        NA            20               8
## # i 39 more rows
## # i 3 more variables: pups_dead_birth <dbl>, pups_survive <dbl>, sq_pups <dbl>
```

```
mutate(litters_df, group = str_to_lower(group))
```

inside values

```
## # A tibble: 49 x 8
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 con7  #85                   19.7        34.7          20               3
##  2 con7  #1/2/95/2              27          42            19               8
##  3 con7  #5/5/3/83/3-3          26          41.4          19               6
##  4 con7  #5/4/2/95/2            28.5        44.1          19               5
##  5 con7  #4/2/95/3-3            NA          NA            20               6
##  6 con7  #2/2/95/3-2            NA          NA            20               6
##  7 con7  #1/5/3/83/3-3/2        NA          NA            20               9
##  8 con8  #3/83/3-3              NA          NA            20               9
##  9 con8  #2/95/3                NA          NA            20               8
## 10 con8  #3/5/2/2/95            28.5        NA            20               8
## # i 39 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
mutate(
  litters_df,
  wt_gain = gd18_weight - gd0_weight,
```

```
  group = str_to_lower(group)
  )
```

```
## # A tibble: 49 x 9
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>            <dbl>
##  1 con7  #85                   19.7        34.7          20                3
##  2 con7  #1/2/95/2             27          42            19                8
##  3 con7  #5/5/3/83/3-3         26          41.4          19                6
##  4 con7  #5/4/2/95/2           28.5        44.1          19                5
##  5 con7  #4/2/95/3-3           NA          NA            20                6
##  6 con7  #2/2/95/3-2           NA          NA            20                6
##  7 con7  #1/5/3/83/3-3/2       NA          NA            20                9
##  8 con8  #3/83/3-3             NA          NA            20                9
##  9 con8  #2/95/3               NA          NA            20                8
## 10 con8  #3/5/2/2/95           28.5        NA            20                8
## # i 39 more rows
## # i 3 more variables: pups_dead_birth <dbl>, pups_survive <dbl>, wt_gain <dbl>
```

arrange

```
arrange(litters_df, gd0_weight)
```

```
## # A tibble: 49 x 8
##    group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>              <dbl>       <dbl>       <dbl>            <dbl>
##  1 Mod7  #59                 17          33.4          19                8
##  2 Mod7  #62                 19.5        35.9          19                7
##  3 Con7  #85                 19.7        34.7          20                3
##  4 Low8  #100                20          39.2          20                8
##  5 Mod7  #103                21.4        42.1          19                9
##  6 Mod7  #106                21.7        37.8          20                5
##  7 Low8  #53                 21.8        37.2          20                8
##  8 Low8  #4/84               21.8        35.2          20                4
##  9 Low7  #85/2               22.2        38.5          20                8
## 10 Mod7  #5/3/83/5-2         22.6        37            19                5
## # i 39 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
arrange(litters_df, desc(gd0_weight))
```

```
## # A tibble: 49 x 8
##    group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>              <dbl>       <dbl>       <dbl>            <dbl>
##  1 Mod8  #82/4               33.4        52.7          20                8
##  2 Con7  #5/4/2/95/2          28.5        44.1          19                5
##  3 Con8  #3/5/2/2/95          28.5        NA            20                8
##  4 Mod8  #2/95/2              28.5        44.5          20                9
##  5 Con8  #5/4/3/83/3          28          NA            19                9
##  6 Mod7  #3/82/3-2            28          45.9          20                5
```

```
##  7 Mod8  #7/110/3-2          27.5        46            19               8
##  8 Con7  #1/2/95/2           27          42            19               8
##  9 Mod8  #7/82-3-2           26.9        43.2          20               7
## 10 Con7  #5/5/3/83/3-3       26          41.4          19               6
## # i 39 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
arrange(litters_df, pups_born_alive, gd0_weight)
```

```
## # A tibble: 49 x 8
##    group litter_number gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>              <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                 19.7        34.7          20               3
##  2 Low7  #111                25.5        44.6          20               3
##  3 Low8  #4/84               21.8        35.2          20               4
##  4 Mod7  #106                21.7        37.8          20               5
##  5 Mod7  #5/3/83/5-2         22.6        37            19               5
##  6 Mod7  #3/82/3-2           28          45.9          20               5
##  7 Con7  #5/4/2/95/2         28.5        44.1          19               5
##  8 Con8  #2/2/95/2           NA          NA            19               5
##  9 Low8  #99                 23.5        39            20               6
## 10 Low7  #112                23.9        40.5          19               6
## # i 39 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

PIPING!!!!!

```
litters_df =
  read_csv("data/FAS_litters.csv", na = c("NA", "", ".")) |>
  janitor::clean_names() |>
  select(-pups_born_alive) |>
  filter(group == "Con7") |>
  mutate(
    wt_gain = gd18_weight - gd0_weight,
    group = str_to_lower(group)
  )
```

```
## Rows: 49 Columns: 8
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (2): Group, Litter Number
## dbl (6): GD0 weight, GD18 weight, GD of Birth, Pups born alive, Pups dead @ ...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

Pipe with the thing is not the first argument.

```
read_csv("data/FAS_litters.csv", na = c("NA", "", ".")) |>
  janitor::clean_names() |>
  mutate()
```

```
## Rows: 49 Columns: 8
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (2): Group, Litter Number
## dbl (6): GD0 weight, GD18 weight, GD of Birth, Pups born alive, Pups dead @ ...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
## # A tibble: 49 x 8
##    group litter_number   gd0_weight gd18_weight gd_of_birth pups_born_alive
##    <chr> <chr>                <dbl>       <dbl>       <dbl>           <dbl>
##  1 Con7  #85                   19.7        34.7          20               3
##  2 Con7  #1/2/95/2             27          42            19               8
##  3 Con7  #5/5/3/83/3-3         26          41.4          19               6
##  4 Con7  #5/4/2/95/2           28.5        44.1          19               5
##  5 Con7  #4/2/95/3-3           NA          NA            20               6
##  6 Con7  #2/2/95/3-2           NA          NA            20               6
##  7 Con7  #1/5/3/83/3-3/2       NA          NA            20               9
##  8 Con8  #3/83/3-3             NA          NA            20               9
##  9 Con8  #2/95/3               NA          NA            20               8
## 10 Con8  #3/5/2/2/95           28.5        NA            20               8
## # i 39 more rows
## # i 2 more variables: pups_dead_birth <dbl>, pups_survive <dbl>
```

```
litters_df =
  read_csv("data/FAS_litters.csv", na = c("NA", "", ".")) |>
  janitor::clean_names() |>
  select(-pups_born_alive) |>
  filter(group == "Con7") |>
  mutate(
    wt_gain = gd18_weight - gd0_weight,
    group = str_to_lower(group)
  )
```

```
## Rows: 49 Columns: 8
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (2): Group, Litter Number
## dbl (6): GD0 weight, GD18 weight, GD of Birth, Pups born alive, Pups dead @ ...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
write_csv(litters_df, "data/cleaned_fas_litters.csv")
```