# Transfer and Persistence Data Analysis

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## Plotting of Transfer Experiment Results - for A

Starting with the simplest dataset e.g. with few samples and combinations. Using the combined spreadsheet "Counts_data.xlsx as all the data should be in there and is the source of the paper's figures.

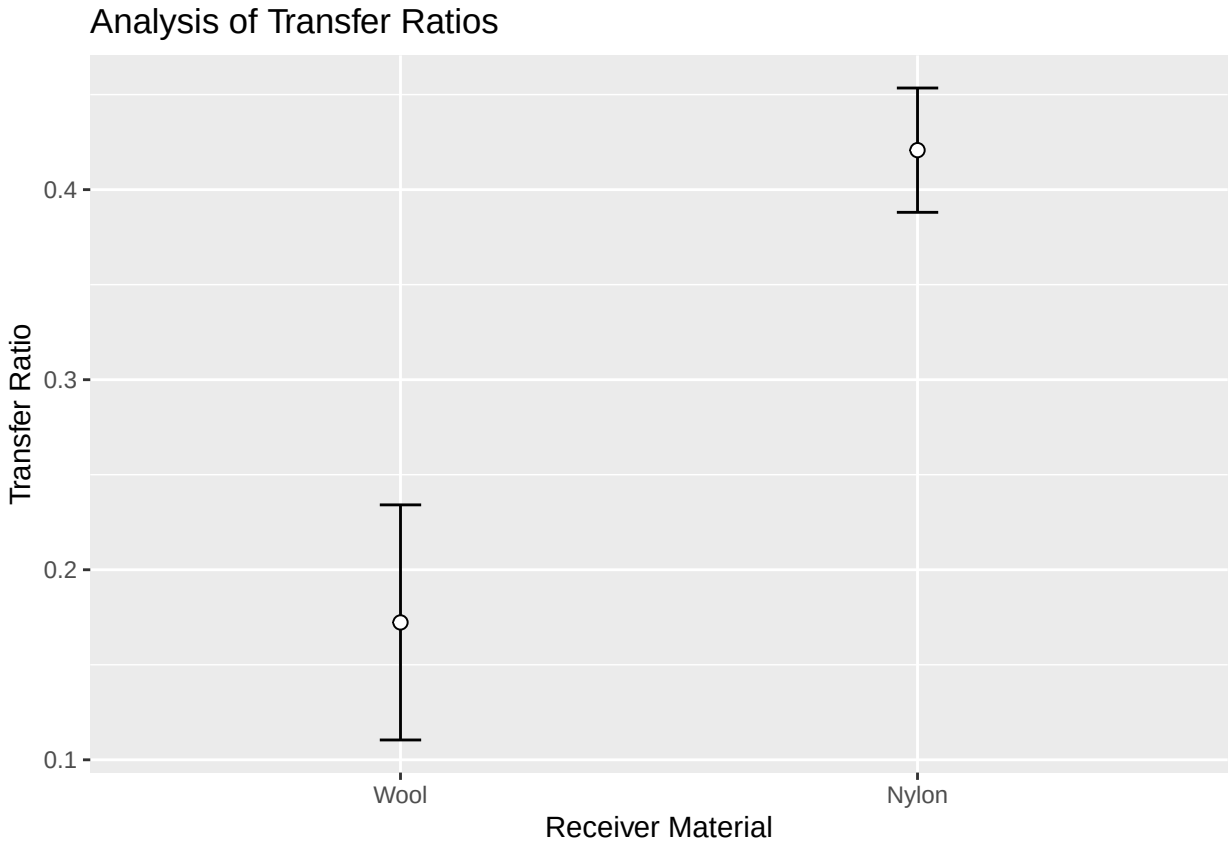
The Transfer experiments are defined by the "Time" column is "0" meaning there has been no Persistence performed yet. By selecting only those that value we can ignore the Persistence experiments (for the time being).

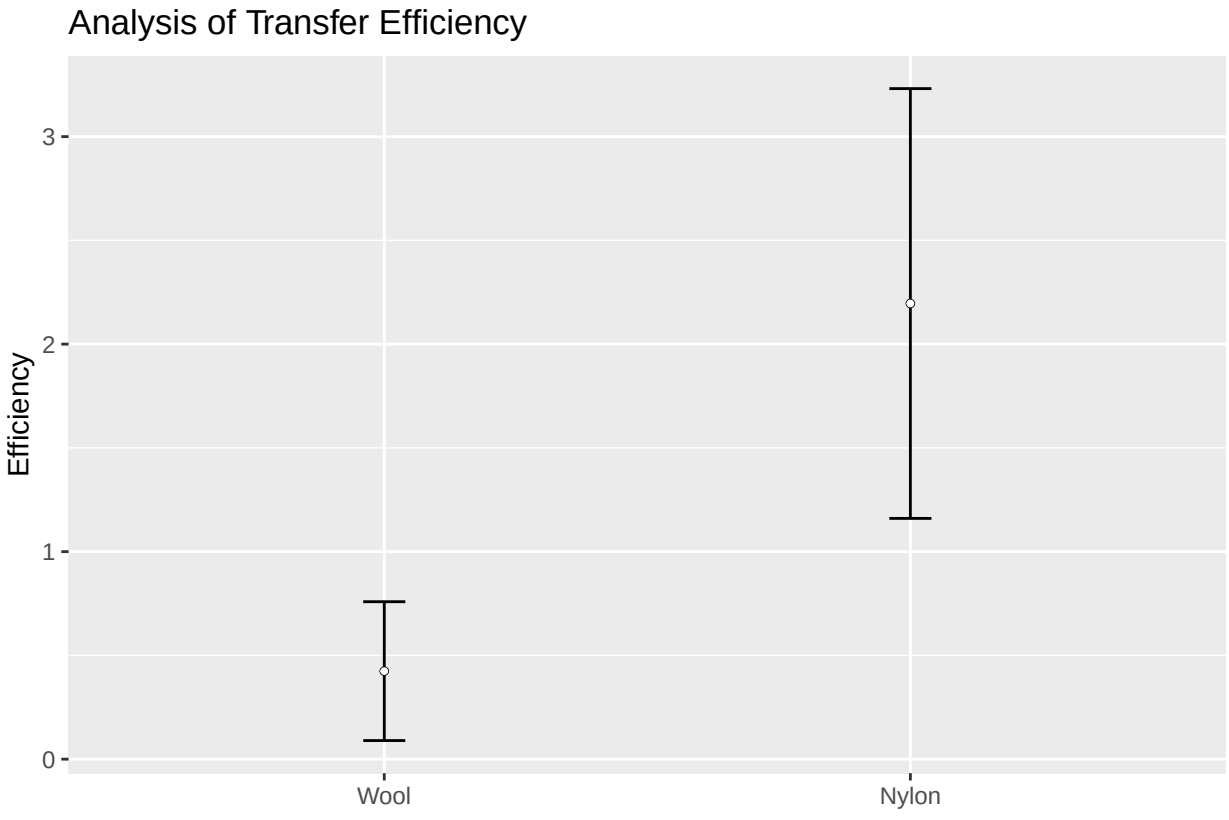
Table 1: 'Head' of ML's Transfer Data

| Substrate | ObservationType | Count | Mass | TransferTime | Experiment | Replicate |
|---|---|---|---|---|---|---|
| Cott01 | Ndata | 20 | 0000 | 000 | 1 | 1 |
| Wool01 | Ndata | 46 | 0000 | 000 | 1 | 1 |
| Cott01 | Uvpo1 | 121 | 1000 | 060 | 1 | 1 |
| Cott01 | Uvpo1 | 70 | 1000 | 060 | 1 | 1 |
| Wool01 | Uvpo1 | 48 | 1000 | 060 | 1 | 1 |
| Cott01 | Ndata | 4 | 0000 | 000 | 2 | 1 |
| Nylo01 | Ndata | 1 | 0000 | 000 | 2 | 1 |
| Cott01 | Uvpo1 | 205 | 1000 | 060 | 2 | 1 |
| Cott01 | Uvpo1 | 142 | 1000 | 060 | 2 | 1 |
| Nylo01 | Uvpo1 | 95 | 1000 | 060 | 2 | 1 |
| Cott01 | Ndata | 31 | 0000 | 000 | 1 | 2 |
| Wool01 | Ndata | 1 | 0000 | 000 | 1 | 2 |
| Cott01 | Uvpo1 | 148 | 1000 | 060 | 1 | 2 |
| Cott01 | Uvpo1 | 66 | 1000 | 060 | 1 | 2 |
| Wool01 | Uvpo1 | 8 | 1000 | 060 | 1 | 2 |
| Cott01 | Ndata | 10 | 0000 | 000 | 2 | 2 |
| Nylo01 | Ndata | 1 | 0000 | 000 | 2 | 2 |
| Cott01 | Uvpo1 | 73 | 1000 | 060 | 2 | 2 |
| Cott01 | Uvpo1 | 69 | 1000 | 060 | 2 | 2 |
| Nylo01 | Uvpo1 | 30 | 1000 | 060 | 2 | 2 |

Table 2: Summary Data for A Transfer Ratios

| Mass | TransferTime | Substrate | N | Ratio | sd | se | ci |
|---|---|---|---|---|---|---|---|
| 1000 | 60 | Wool01 | 6 | 0.1722808 | 0.1515063 | 0.0618522 | 0.1589961 |
| 1000 | 60 | Nylo01 | 6 | 0.4207696 | 0.0801125 | 0.0327058 | 0.0840730 |


Analysis of Transfer Ratios
Transfer Ratio
0.4
0.3
0.2
0.1
Wool
Nylon
Receiver Material


Analysis of Transfer Efficiency
Efficiency
3
2
1
0
Wool
Nylon

## Read B Data

Table 3: 'Head' of B Transfer Data

| Substrate | ObservationType | Count | Mass | TransferTime | Experiment | Replicate |
|---|---|---|---|---|---|---|
| Cott01 | Ndata | 142 | 0000 | 000 | 9 | 1 |
| Nylo01 | Ndata | 25 | 0000 | 000 | 9 | 1 |
| Cott01 | Uvpo1 | 282 | 1000 | 060 | 9 | 1 |
| Cott01 | Uvpo1 | 214 | 1000 | 060 | 9 | 1 |
| Nylo01 | Uvpo1 | 91 | 1000 | 060 | 9 | 1 |
| Cott01 | Ndata | 166 | 0000 | 000 | 9 | 2 |
| Nylo01 | Ndata | 28 | 0000 | 000 | 9 | 2 |
| Cott01 | Uvpo1 | 282 | 1000 | 060 | 9 | 2 |
| Cott01 | Uvpo1 | 214 | 1000 | 060 | 9 | 2 |
| Nylo01 | Uvpo1 | 51 | 1000 | 060 | 9 | 2 |
| Cott01 | Ndata | 151 | 0000 | 000 | 9 | 3 |
| Nylo01 | Ndata | 37 | 0000 | 000 | 9 | 3 |
| Cott01 | Uvpo1 | 264 | 1000 | 060 | 9 | 3 |
| Cott01 | Uvpo1 | 188 | 1000 | 060 | 9 | 3 |
| Nylo01 | Uvpo1 | 56 | 1000 | 060 | 9 | 3 |
| Cott01 | Ndata | 151 | 0000 | 000 | 9 | 4 |
| Nylo01 | Ndata | 57 | 0000 | 000 | 9 | 4 |
| Cott01 | Uvpo1 | 166 | 1000 | 060 | 9 | 4 |
| Cott01 | Uvpo1 | 150 | 1000 | 060 | 9 | 4 |
| Nylo01 | Uvpo1 | 62 | 1000 | 060 | 9 | 4 |

Table 4: Summary Data for B Transfer Ratios

| Mass | TransferTime | Substrate | N | Ratio | sd | se | ci |
|---|---|---|---|---|---|---|---|
| 200 | 60 | Nylo01 | 6 | -0.0342778 | 0.5632213 | 0.2299341 | 0.5910645 |
| 200 | 60 | Wool01 | 6 | 0.1338963 | 0.0588358 | 0.0240196 | 0.0617444 |
| 500 | 60 | Nylo01 | 6 | 0.2028366 | 0.1266029 | 0.0516854 | 0.1328616 |
| 500 | 60 | Wool01 | 6 | 0.1284607 | 0.0917462 | 0.0374552 | 0.0962818 |
| 700 | 60 | Nylo01 | 6 | -0.2240270 | 0.8942029 | 0.3650568 | 0.9384084 |
| 700 | 60 | Wool01 | 6 | 0.1938328 | 0.0464003 | 0.0189428 | 0.0486941 |
| 1000 | 30 | Wool01 | 6 | 0.0978378 | 0.0598697 | 0.0244417 | 0.0628294 |
| 1000 | 60 | Deni01 | 6 | 0.4967478 | 0.1266902 | 0.0517211 | 0.1329533 |
| 1000 | 60 | Nylo01 | 6 | 0.4309259 | 0.2401147 | 0.0980264 | 0.2519849 |
| 1000 | 60 | Wool01 | 6 | 0.1675380 | 0.0840088 | 0.0342964 | 0.0881618 |
| 1000 | 120 | Nylo01 | 6 | 0.4566484 | 0.6064524 | 0.2475832 | 0.6364328 |
| 1000 | 120 | Wool01 | 6 | 0.1646794 | 0.0949062 | 0.0387453 | 0.0995979 |
| 1000 | 240 | Nylo01 | 6 | 0.2979985 | 0.2554603 | 0.1042912 | 0.2680892 |
| 1000 | 240 | Wool01 | 6 | 0.1314790 | 0.0630389 | 0.0257355 | 0.0661552 |

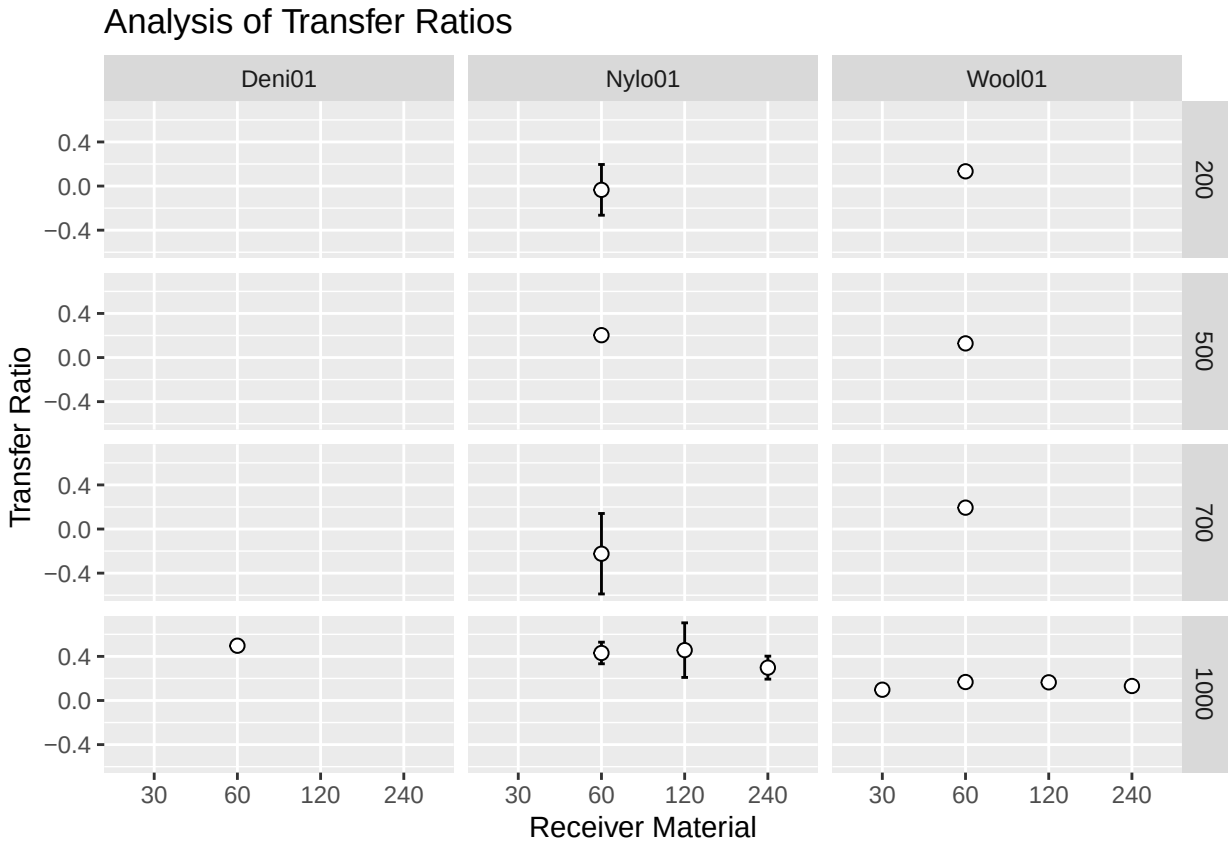
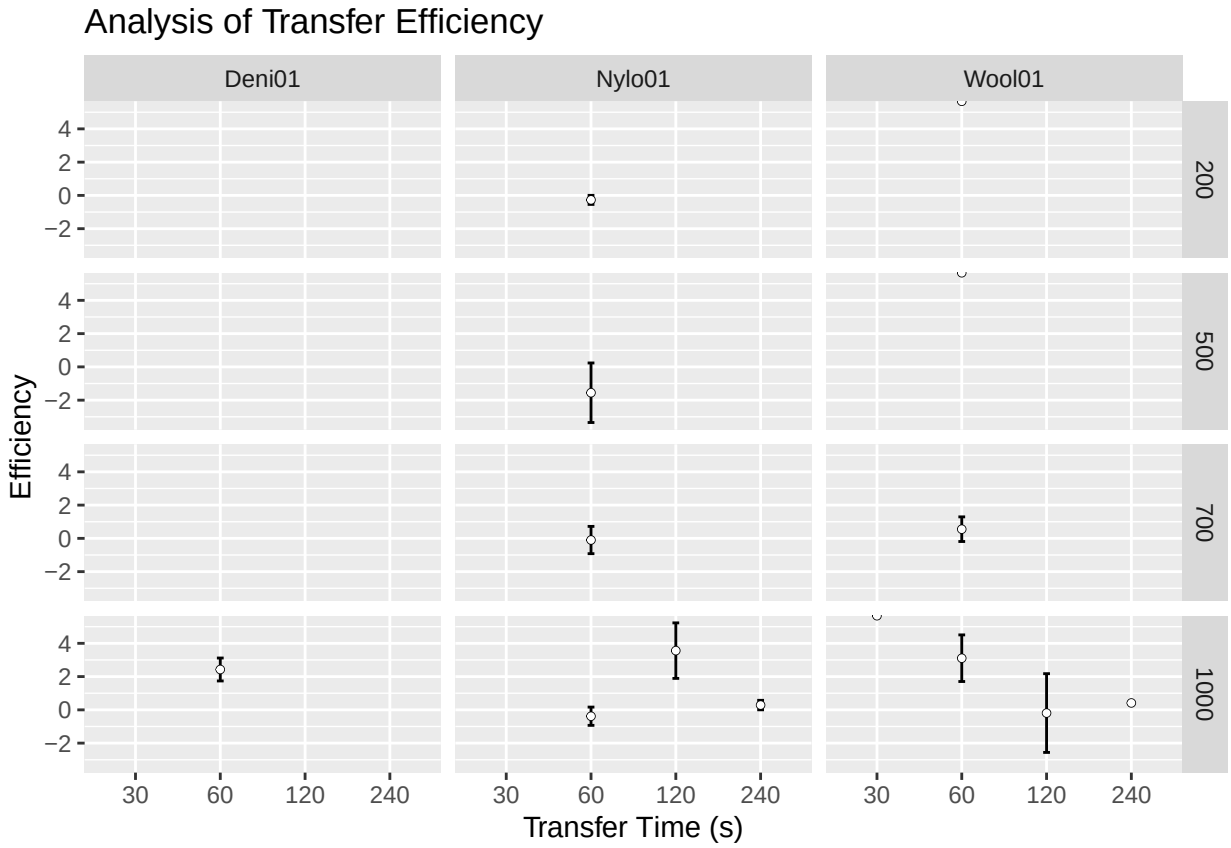



Table 5: Efficiency data for B

| Mass | TransferTime | Substrate | N | Efficiency | sd | se | ci |
|---|---|---|---|---|---|---|---|
| 200 | 60 | Nylo01 | 6 | -0.2685916 | 0.6681670 | 0.2727781 | 0.7011983 |
| 200 | 60 | Wool01 | 6 | Inf | NaN | NaN | NaN |
| 500 | 60 | Nylo01 | 6 | -1.5537063 | 4.3858910 | 1.7905325 | 4.6027103 |
| 500 | 60 | Wool01 | 6 | Inf | NaN | NaN | NaN |
| 700 | 60 | Nylo01 | 6 | -0.0992262 | 2.0074485 | 0.8195374 | 2.1066880 |
| 700 | 60 | Wool01 | 6 | 0.5521886 | 1.8144115 | 0.7407304 | 1.9041081 |
| 1000 | 30 | Wool01 | 6 | Inf | NaN | NaN | NaN |
| 1000 | 60 | Deni01 | 6 | 2.4266632 | 1.6897007 | 0.6898174 | 1.7732321 |
| 1000 | 60 | Nylo01 | 6 | -0.3835150 | 1.3456210 | 0.5493475 | 1.4121427 |
| 1000 | 60 | Wool01 | 6 | 3.1051587 | 3.4326399 | 1.4013694 | 3.6023347 |
| 1000 | 120 | Nylo01 | 6 | 3.5599361 | 4.0885331 | 1.6691367 | 4.2906524 |
| 1000 | 120 | Wool01 | 6 | -0.1922619 | 5.7981526 | 2.3670859 | 6.0847880 |
| 1000 | 240 | Nylo01 | 6 | 0.2884312 | 0.6992647 | 0.2854736 | 0.7338333 |
| 1000 | 240 | Wool01 | 6 | 0.4143278 | 0.1695091 | 0.0692018 | 0.1778889 |




Hmm. Getting infinity values for some of the datapoints. To investigate.

## Read C Data

In trying to replicate the above for C data, I found that the "Time" column didn't make sense (an incrementing value per row) so from now on will use the cleaned data which was used for the file-renamer.

Table 6: 'Head' of C Transfer Data

| Substrate | ObservationType | Count | Mass | TransferTime | Experiment | Replicate |
|---|---|---|---|---|---|---|
| Cott01 | Ndata | 0 | 0 | 0 | 1 | 1 |
| Wool01 | Ndata | 0 | 0 | 0 | 1 | 1 |
| Cott01 | Uvpo1 | 107 | 0 | 0 | 1 | 1 |
| Cott01 | Uvpo1 | 91 | 1000 | 30 | 1 | 1 |
| Wool01 | Uvpo1 | 1 | 1000 | 30 | 1 | 1 |
| Cott01 | Ndata | 0 | 0 | 0 | 1 | 2 |
| Wool01 | Ndata | 0 | 0 | 0 | 1 | 2 |
| Cott01 | Uvpo1 | 123 | 0 | 0 | 1 | 2 |
| Cott01 | Uvpo1 | 108 | 1000 | 30 | 1 | 2 |
| Wool01 | Uvpo1 | 6 | 1000 | 30 | 1 | 2 |
| Cott01 | Ndata | 0 | 0 | 0 | 1 | 3 |
| Wool01 | Ndata | 0 | 0 | 0 | 1 | 3 |
| Cott01 | Uvpo1 | 58 | 0 | 0 | 1 | 3 |
| Cott01 | Uvpo1 | 42 | 1000 | 30 | 1 | 3 |
| Wool01 | Uvpo1 | 3 | 1000 | 30 | 1 | 3 |
| Cott01 | Ndata | 0 | 0 | 0 | 1 | 4 |
| Wool01 | Ndata | 0 | 0 | 0 | 1 | 4 |
| Cott01 | Uvpo1 | 81 | 0 | 0 | 1 | 4 |

| Substrate | ObservationType | Count | Mass | TransferTime | Experiment | Replicate |
|---|---|---|---|---|---|---|
| Cott01 | Uvpo1 | 51 | 1000 | 30 | 1 | 4 |
| Wool01 | Uvpo1 | 0 | 1000 | 30 | 1 | 4 |

Table 7: Summary Data for C Transfer Ratios

| Mass | TransferTime | Substrate | N | Ratio | sd | se | ci |
|---|---|---|---|---|---|---|---|
| 1000 | 120 | Nylo01 | 6 | 0.3348185 | 0.1307888 | 0.0533943 | 0.1372545 |
| 1000 | 120 | Wool01 | 6 | 0.0337128 | 0.0317159 | 0.0129480 | 0.0332838 |
| 1000 | 240 | Nylo01 | 6 | 0.3488004 | 0.1307502 | 0.0533785 | 0.1372139 |
| 1000 | 240 | Wool01 | 6 | 0.0427312 | 0.0446728 | 0.0182376 | 0.0468812 |
| 1000 | 30 | Nylo01 | 5 | 0.3372719 | 0.1449379 | 0.0648182 | 0.1799641 |
| 1000 | 30 | Wool01 | 6 | 0.0516072 | 0.0540128 | 0.0220506 | 0.0566829 |
| 1000 | 60 | Nylo01 | 6 | 0.3640935 | 0.1516866 | 0.0619258 | 0.1591853 |
| 1000 | 60 | Wool01 | 6 | 0.0378939 | 0.0356767 | 0.0145650 | 0.0374404 |
| 200 | 60 | Nylo01 | 6 | 0.3620949 | 0.2110073 | 0.0861434 | 0.2214386 |
| 200 | 60 | Wool01 | 6 | 0.0302975 | 0.0259474 | 0.0105930 | 0.0272301 |
| 500 | 60 | Nylo01 | 6 | 0.2991406 | 0.1772545 | 0.0723639 | 0.1860172 |
| 500 | 60 | Wool01 | 6 | 0.0323172 | 0.0305062 | 0.0124541 | 0.0320143 |
| 700 | 60 | Nylo01 | 6 | 0.4105965 | 0.1653907 | 0.0675205 | 0.1735669 |
| 700 | 60 | Wool01 | 6 | 0.0526802 | 0.0387257 | 0.0158097 | 0.0406401 |

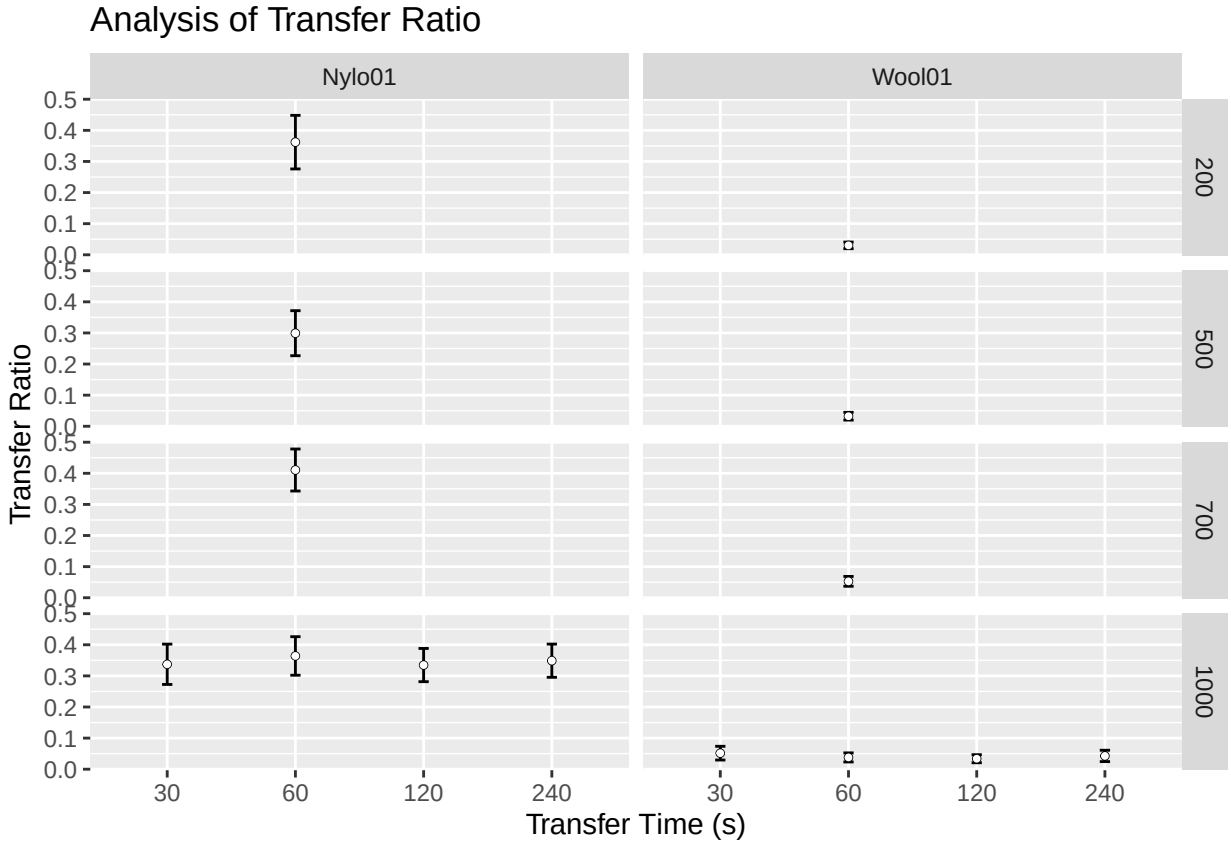
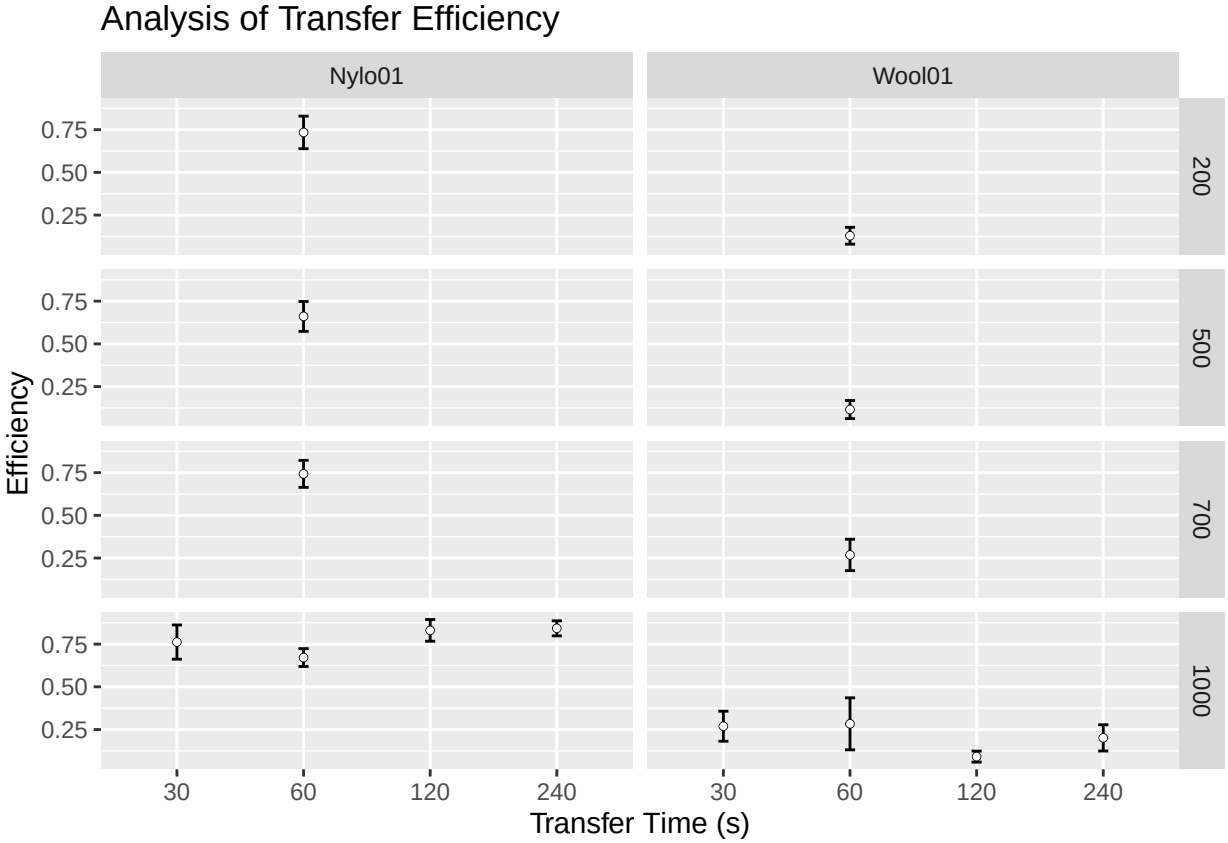


Table 8: Efficiency data for C

| Mass | TransferTime | Substrate | N | Efficiency | sd | se | ci |
|---|---|---|---|---|---|---|---|
| 1000 | 120 | Nylo01 | 6 | 0.8305225 | 0.1555389 | 0.0634985 | 0.1632280 |
| 1000 | 120 | Wool01 | 6 | 0.0916896 | 0.0793069 | 0.0323769 | 0.0832274 |
| 1000 | 240 | Nylo01 | 6 | 0.8424325 | 0.1078329 | 0.0440226 | 0.1131637 |
| 1000 | 240 | Wool01 | 6 | 0.2011204 | 0.1880151 | 0.0767568 | 0.1973097 |
| 1000 | 30 | Nylo01 | 5 | 0.7620170 | 0.2237431 | 0.1000609 | 0.2778137 |
| 1000 | 30 | Wool01 | 6 | 0.2694444 | 0.2150527 | 0.0877949 | 0.2256840 |
| 1000 | 60 | Nylo01 | 6 | 0.6712203 | 0.1281090 | 0.0523003 | 0.1344421 |
| 1000 | 60 | Wool01 | 6 | 0.2834795 | 0.3731486 | 0.1523373 | 0.3915955 |
| 200 | 60 | Nylo01 | 6 | 0.7338422 | 0.2335260 | 0.0953366 | 0.2450705 |
| 200 | 60 | Wool01 | 6 | 0.1292639 | 0.1206931 | 0.0492728 | 0.1266596 |
| 500 | 60 | Nylo01 | 6 | 0.6607276 | 0.2138730 | 0.0873133 | 0.2244459 |
| 500 | 60 | Wool01 | 6 | 0.1156102 | 0.1294067 | 0.0528301 | 0.1358040 |
| 700 | 60 | Nylo01 | 6 | 0.7429037 | 0.1934802 | 0.0789880 | 0.2030450 |
| 700 | 60 | Wool01 | 6 | 0.2684238 | 0.2251887 | 0.0919329 | 0.2363210 |




## D Data

Table 9: 'Head' of D Transfer Data

| Substrate | ObservationType | Count | Mass | TransferTime | Experiment | Replicate |
|---|---|---|---|---|---|---|
| Cott01 | Ndata | 89 | 0 | 0 | 11 | 1 |
| Wool01 | Ndata | 1 | 0 | 0 | 11 | 1 |

| Substrate | ObservationType | Count | Mass | TransferTime | Experiment | Replicate |
|---|---|---|---|---|---|---|
| Cott01 | Uvpo1 | 182 | 0 | 0 | 11 | 1 |
| Cott01 | Uvpo1 | 172 | 1000 | 30 | 11 | 1 |
| Wool01 | Uvpo1 | 89 | 1000 | 30 | 11 | 1 |
| Cott01 | Ndata | 81 | 0 | 0 | 1 | 1 |
| Nylo01 | Ndata | 1 | 0 | 0 | 1 | 1 |
| Cott01 | Uvpo1 | 159 | 0 | 0 | 1 | 1 |
| Cott01 | Uvpo1 | 152 | 1000 | 30 | 1 | 1 |
| Nylo01 | Uvpo1 | 100 | 1000 | 30 | 1 | 1 |
| Cott01 | Ndata | 59 | 0 | 0 | 1 | 2 |
| Nylo01 | Ndata | 2 | 0 | 0 | 1 | 2 |
| Cott01 | Uvpo1 | 270 | 0 | 0 | 1 | 2 |
| Cott01 | Uvpo1 | 155 | 1000 | 30 | 1 | 2 |
| Nylo01 | Uvpo1 | 152 | 1000 | 30 | 1 | 2 |
| Cott01 | Ndata | 49 | 0 | 0 | 1 | 3 |
| Nylo01 | Ndata | 2 | 0 | 0 | 1 | 3 |
| Cott01 | Uvpo1 | 320 | 0 | 0 | 1 | 3 |
| Cott01 | Uvpo1 | 156 | 1000 | 30 | 1 | 3 |
| Nylo01 | Uvpo1 | 143 | 1000 | 30 | 1 | 3 |

Table 10: Summary Data for D Transfer Ratios

| Mass | TransferTime | Substrate | N | Ratio | sd | se | ci |
|---|---|---|---|---|---|---|---|
| 1000 | 120 | Nylo01 | 6 | 0.8689225 | 0.2600158 | 0.1061510 | 0.2728699 |
| 1000 | 120 | Wool01 | 6 | 0.8473962 | 0.1889595 | 0.0771424 | 0.1983008 |
| 1000 | 240 | Nylo01 | 6 | 0.5036197 | 0.3117237 | 0.1272607 | 0.3271340 |
| 1000 | 240 | Wool01 | 6 | 0.5954625 | 0.5040950 | 0.2057959 | 0.5290152 |
| 1000 | 30 | Deni01 | 6 | 1.3476846 | 0.8049645 | 0.3286254 | 0.8447585 |
| 1000 | 30 | Nylo01 | 6 | 0.7454885 | 0.3934754 | 0.1606357 | 0.4129271 |
| 1000 | 30 | Wool01 | 6 | 0.5428876 | 0.5375483 | 0.2194532 | 0.5641223 |
| 1000 | 60 | Nylo01 | 6 | 0.9770824 | 0.5168077 | 0.2109859 | 0.5423565 |
| 1000 | 60 | Wool01 | 6 | 0.5610459 | 0.6332315 | 0.2585157 | 0.6645357 |
| 200 | 60 | Nylo01 | 6 | 0.3068359 | 0.0848446 | 0.0346377 | 0.0890390 |
| 200 | 60 | Wool01 | 6 | 0.5001868 | 0.3909773 | 0.1596158 | 0.4103055 |
| 500 | 60 | Nylo01 | 6 | 0.5062667 | 0.3127171 | 0.1276662 | 0.3281765 |
| 500 | 60 | Wool01 | 6 | 0.4213237 | 0.2670105 | 0.1090066 | 0.2802103 |
| 700 | 60 | Nylo01 | 6 | 0.3916311 | 0.1003462 | 0.0409662 | 0.1053069 |
| 700 | 60 | Wool01 | 6 | 0.8506554 | 0.2444893 | 0.0998124 | 0.2565758 |

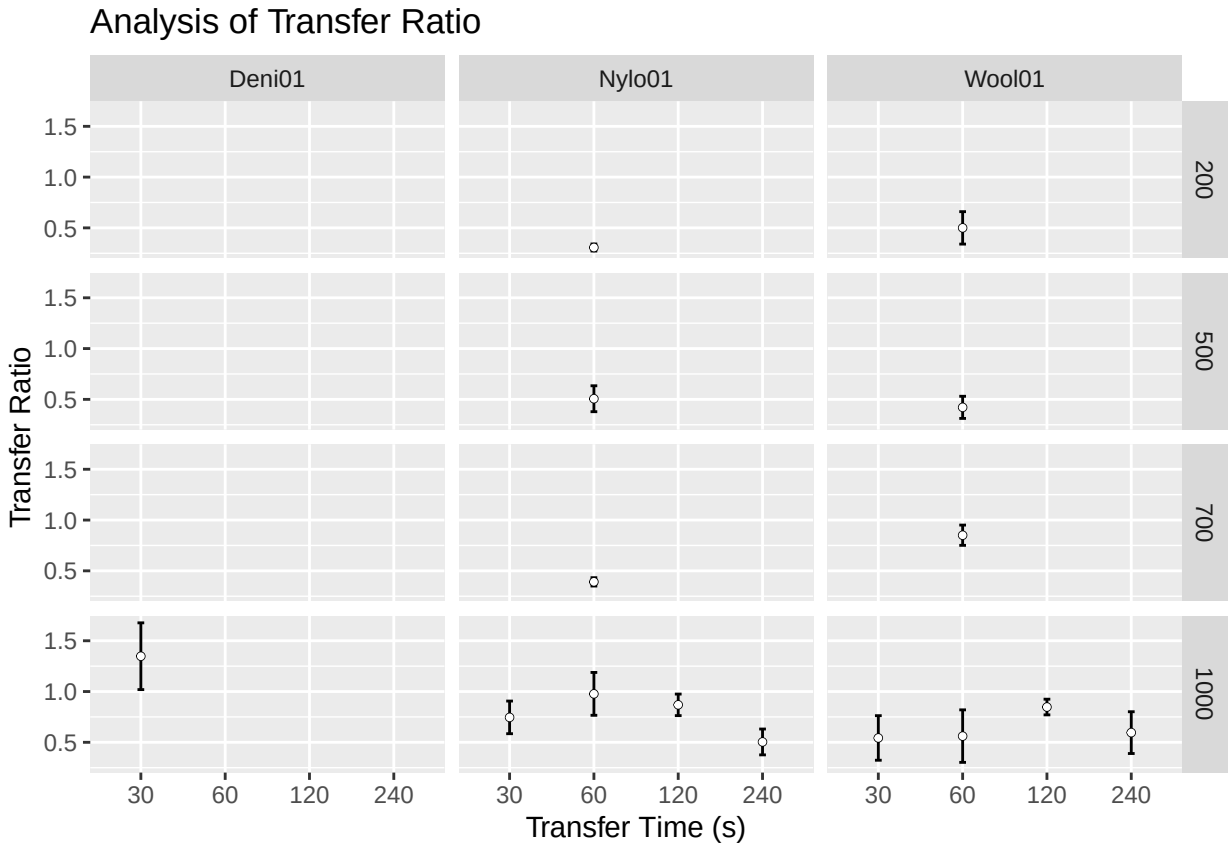
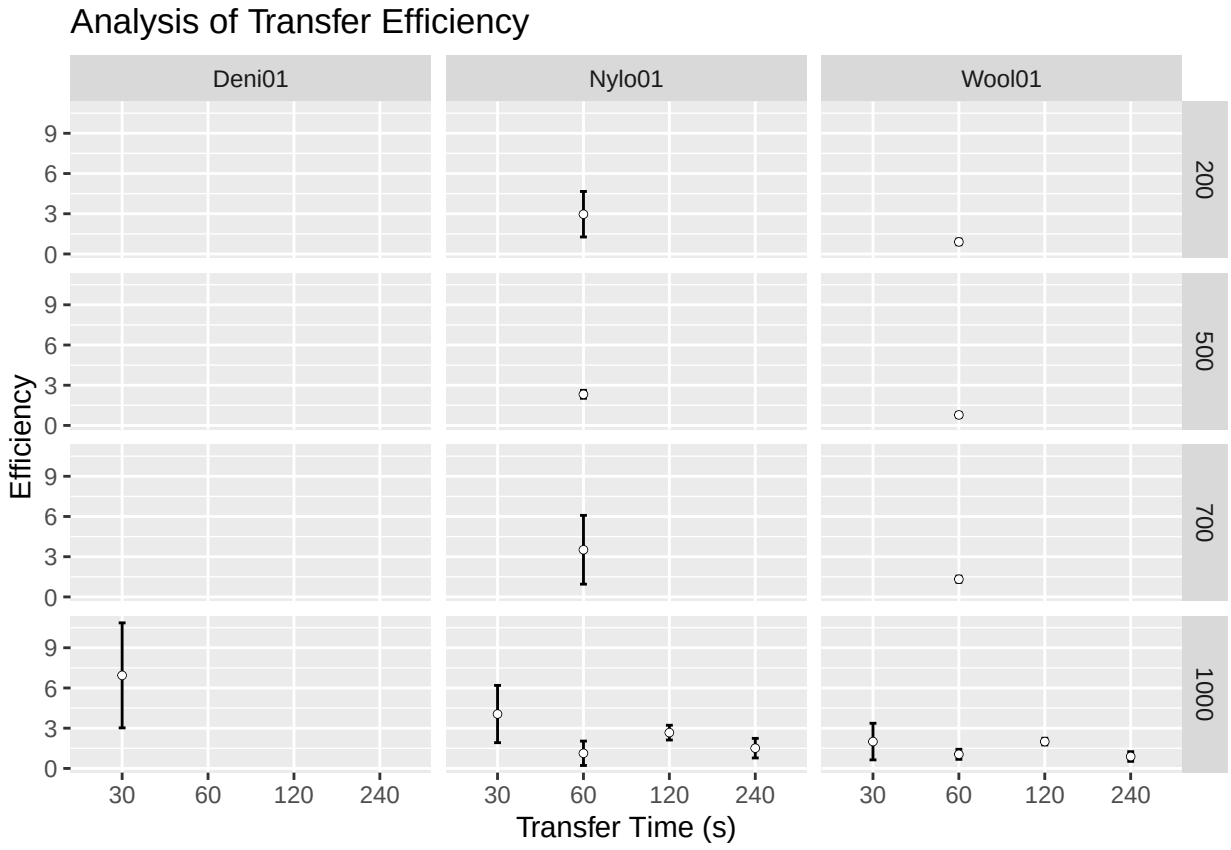



Table 11: Efficiency data for D

| Set | Mass | TransferTime | Substrate | N | Efficiency | sd | se | ci |
|---|---|---|---|---|---|---|---|---|
| D | 1000 | 120 | Nylo01 | 6 | 2.6699679 | 1.3478312 | 0.5502498 | 1.4144621 |
| D | 1000 | 120 | Wool01 | 6 | 2.0022817 | 0.6068378 | 0.2477405 | 0.6368372 |
| D | 1000 | 240 | Nylo01 | 6 | 1.5109170 | 1.7883054 | 0.7300726 | 1.8767114 |
| D | 1000 | 240 | Wool01 | 6 | 0.8876003 | 0.8865460 | 0.3619309 | 0.9303730 |
| D | 1000 | 30 | Deni01 | 6 | 6.9400517 | 9.5904499 | 3.9152848 | 10.0645599 |
| D | 1000 | 30 | Nylo01 | 6 | 4.0561775 | 5.2318611 | 2.1358983 | 5.4905015 |
| D | 1000 | 30 | Wool01 | 6 | 2.0025139 | 3.3406817 | 1.3638276 | 3.5058305 |
| D | 1000 | 60 | Nylo01 | 6 | 1.1287837 | 2.2285891 | 0.9098177 | 2.3387608 |
| D | 1000 | 60 | Wool01 | 6 | 1.0527281 | 0.9137557 | 0.3730392 | 0.9589278 |
| D | 200 | 60 | Nylo01 | 6 | 2.9647290 | 4.1587253 | 1.6977925 | 4.3643146 |
| D | 200 | 60 | Wool01 | 6 | 0.9006566 | 0.5167049 | 0.2109439 | 0.5422485 |
| D | 500 | 60 | Nylo01 | 6 | 2.3242987 | 0.7267779 | 0.2967059 | 0.7627067 |
| D | 500 | 60 | Wool01 | 6 | 0.7853393 | 0.4341273 | 0.1772317 | 0.4555886 |
| D | 700 | 60 | Nylo01 | 6 | 3.5178882 | 6.2828775 | 2.5649740 | 6.5934755 |
| D | 700 | 60 | Wool01 | 6 | 1.3226351 | 0.5579647 | 0.2277881 | 0.5855480 |




## E Data

This data is a little different from the others as this study includes an analysis of camera settings - specified in the "Note" column as C1 or C2. That information is included in the analysis and the two camera settings reported separately.

In the comparison to the other datasets only the C1 camera data is used, for pragmatic reasons.

Table 12: 'Head' of E Transfer Data

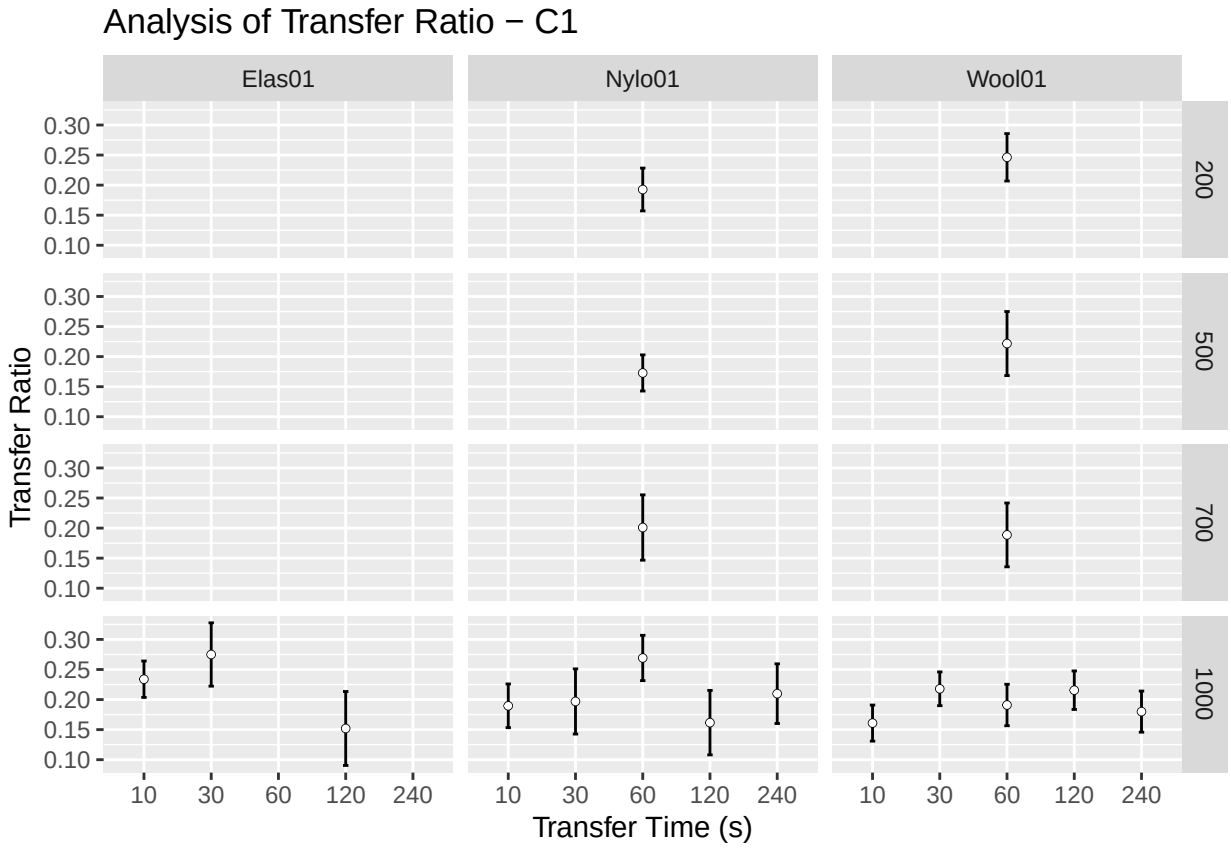
| Substrate | ObservationType | Count | Mass | TransferTime | Experiment | Replicate | Note |
|---|---|---|---|---|---|---|---|
| Cott01 | Ndata | 4 | 0 | 0 | 1 | 1 | C1 |
| Nylo01 | Ndata | 4 | 0 | 0 | 1 | 1 | C1 |
| Cott01 | Uvpo1 | 100 | 0 | 0 | 1 | 1 | C1 |
| Cott01 | Uvpo1 | 81 | 1000 | 30 | 1 | 1 | C1 |
| Nylo01 | Uvpo1 | 21 | 1000 | 30 | 1 | 1 | C1 |
| Cott01 | Ndata | 0 | 0 | 0 | 1 | 2 | C1 |
| Nylo01 | Ndata | 2 | 0 | 0 | 1 | 2 | C1 |
| Cott01 | Uvpo1 | 151 | 0 | 0 | 1 | 2 | C1 |
| Cott01 | Uvpo1 | 135 | 1000 | 30 | 1 | 2 | C1 |
| Nylo01 | Uvpo1 | 35 | 1000 | 30 | 1 | 2 | C1 |
| Cott01 | Ndata | 4 | 0 | 0 | 1 | 3 | C1 |
| Nylo01 | Ndata | 4 | 0 | 0 | 1 | 3 | C1 |
| Cott01 | Uvpo1 | 46 | 0 | 0 | 1 | 3 | C1 |
| Cott01 | Uvpo1 | 47 | 1000 | 30 | 1 | 3 | C1 |
| Nylo01 | Uvpo1 | 16 | 1000 | 30 | 1 | 3 | C1 |
| Cott01 | Ndata | 4 | 0 | 0 | 1 | 4 | C1 |

| Substrate | ObservationType | Count | Mass | TransferTime | Experiment | Replicate | Note |
|---|---|---|---|---|---|---|---|
| Nylo01 | Ndata | 5 | 0 | 0 | 1 | 4 | C1 |
| Cott01 | Uvpo1 | 24 | 0 | 0 | 1 | 4 | C1 |
| Cott01 | Uvpo1 | 21 | 1000 | 30 | 1 | 4 | C1 |
| Nylo01 | Uvpo1 | 5 | 1000 | 30 | 1 | 4 | C1 |

Table 13: Summary Data for E Transfer Ratios

| | Mass | TransferTime | Substrate | Experiment | Note | N | Ratio | sd | se | ci |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1000 | 10 | Elas01 | 41 | C1 | 6 | 0.2338381 | 0.0741839 | 0.0302854 | 0.0778512 |
| 2 | 1000 | 10 | Elas01 | 42 | C2 | 6 | 0.2868970 | 0.0918738 | 0.0375073 | 0.0964156 |
| 3 | 1000 | 10 | Nylo01 | 29 | C1 | 3 | 0.1895775 | 0.0629581 | 0.0363489 | 0.1563967 |
| 4 | 1000 | 10 | Nylo01 | 30 | C2 | 3 | 0.2718908 | 0.0325974 | 0.0188201 | 0.0809764 |
| 5 | 1000 | 10 | Wool01 | 31 | C1 | 6 | 0.1608553 | 0.0734861 | 0.0300006 | 0.0771189 |
| 6 | 1000 | 10 | Wool01 | 32 | C2 | 6 | 0.3107039 | 0.1350947 | 0.0551522 | 0.1417732 |
| 7 | 1000 | 120 | Elas01 | 37 | C1 | 2 | 0.1518923 | 0.0869696 | 0.0614968 | 0.7813912 |
| 8 | 1000 | 120 | Elas01 | 38 | C2 | 2 | 0.2365703 | 0.0822599 | 0.0581665 | 0.7390760 |
| 9 | 1000 | 120 | Nylo01 | 3 | C1 | 5 | 0.1615913 | 0.1200060 | 0.0536683 | 0.1490071 |
| 10 | 1000 | 120 | Nylo01 | 4 | C2 | 5 | 0.1436581 | 0.0599683 | 0.0268187 | 0.0744605 |
| 11 | 1000 | 120 | Wool01 | 19 | C1 | 5 | 0.2155738 | 0.0716007 | 0.0320208 | 0.0889041 |
| 12 | 1000 | 120 | Wool01 | 20 | C2 | 5 | 0.2167934 | 0.0830756 | 0.0371525 | 0.1031520 |
| 13 | 1000 | 240 | Nylo01 | 5 | C1 | 4 | 0.2097961 | 0.0992487 | 0.0496243 | 0.1579268 |
| 14 | 1000 | 240 | Nylo01 | 6 | C2 | 3 | 0.2153112 | 0.1378391 | 0.0795815 | 0.3424114 |
| 15 | 1000 | 240 | Wool01 | 25 | C1 | 6 | 0.1799438 | 0.0837790 | 0.0342026 | 0.0879206 |
| 16 | 1000 | 240 | Wool01 | 26 | C2 | 6 | 0.2721513 | 0.0601230 | 0.0245451 | 0.0630952 |
| 17 | 1000 | 30 | Elas01 | 33 | C1 | 6 | 0.2749656 | 0.1289479 | 0.0526428 | 0.1353225 |
| 18 | 1000 | 30 | Elas01 | 34 | C2 | 6 | 0.2303146 | 0.0818126 | 0.0333999 | 0.0858571 |
| 19 | 1000 | 30 | Nylo01 | 1 | C1 | 5 | 0.1968279 | 0.1211747 | 0.0541910 | 0.1504583 |
| 20 | 1000 | 30 | Nylo01 | 2 | C2 | 5 | 0.1579633 | 0.0912528 | 0.0408095 | 0.1133053 |
| 21 | 1000 | 30 | Wool01 | 15 | C1 | 4 | 0.2178964 | 0.0561319 | 0.0280659 | 0.0893184 |
| 22 | 1000 | 30 | Wool01 | 16 | C2 | 4 | 0.2473069 | 0.0868115 | 0.0434057 | 0.1381365 |
| 25 | 1000 | 60 | Nylo01 | 7 | C1 | 8 | 0.2691769 | 0.1066598 | 0.0377099 | 0.0891698 |
| 26 | 1000 | 60 | Nylo01 | 8 | C2 | 7 | 0.3832045 | 0.1723505 | 0.0651424 | 0.1593977 |
| 27 | 1000 | 60 | Wool01 | 17 | C1 | 5 | 0.1909401 | 0.0770871 | 0.0344744 | 0.0957163 |
| 28 | 1000 | 60 | Wool01 | 18 | C2 | 6 | 0.2583069 | 0.0548124 | 0.0223771 | 0.0575221 |
| 29 | 200 | 60 | Nylo01 | 13 | C1 | 6 | 0.1927424 | 0.0871142 | 0.0355642 | 0.0914208 |
| 30 | 200 | 60 | Nylo01 | 14 | C2 | 6 | 0.1458026 | 0.0858242 | 0.0350376 | 0.0900670 |
| 31 | 200 | 60 | Wool01 | 27 | C1 | 2 | 0.2463054 | 0.0557326 | 0.0394089 | 0.5007371 |
| 33 | 500 | 60 | Nylo01 | 11 | C1 | 3 | 0.1728064 | 0.0520260 | 0.0300372 | 0.1292398 |
| 34 | 500 | 60 | Nylo01 | 12 | C2 | 4 | 0.2321003 | 0.0667902 | 0.0333951 | 0.1062780 |
| 35 | 500 | 60 | Wool01 | 23 | C1 | 5 | 0.2217096 | 0.1191345 | 0.0532786 | 0.1479250 |
| 36 | 500 | 60 | Wool01 | 24 | C2 | 5 | 0.1860587 | 0.0713513 | 0.0319093 | 0.0885943 |
| 37 | 700 | 60 | Nylo01 | 10 | C2 | 6 | 0.2693152 | 0.0598580 | 0.0244369 | 0.0628171 |
| 38 | 700 | 60 | Nylo01 | 9 | C1 | 6 | 0.2009331 | 0.1330634 | 0.0543229 | 0.1396415 |
| 39 | 700 | 60 | Wool01 | 21 | C1 | 4 | 0.1886549 | 0.1061766 | 0.0530883 | 0.1689507 |
| 40 | 700 | 60 | Wool01 | 22 | C2 | 5 | 0.2118627 | 0.0805434 | 0.0360201 | 0.1000079 |

Added an extra column for “Experiment” in addition to “Substrate” here as there seems to be too many replicates?? Need to investigate further.


Analysis of Transfer Ratio − C1
Elas01
Nylo01
Wool01
200
500
700
1000
Transfer Ratio
0.30
0.25
0.20
0.15
0.10
10
30
60
120
240
Transfer Time (s)

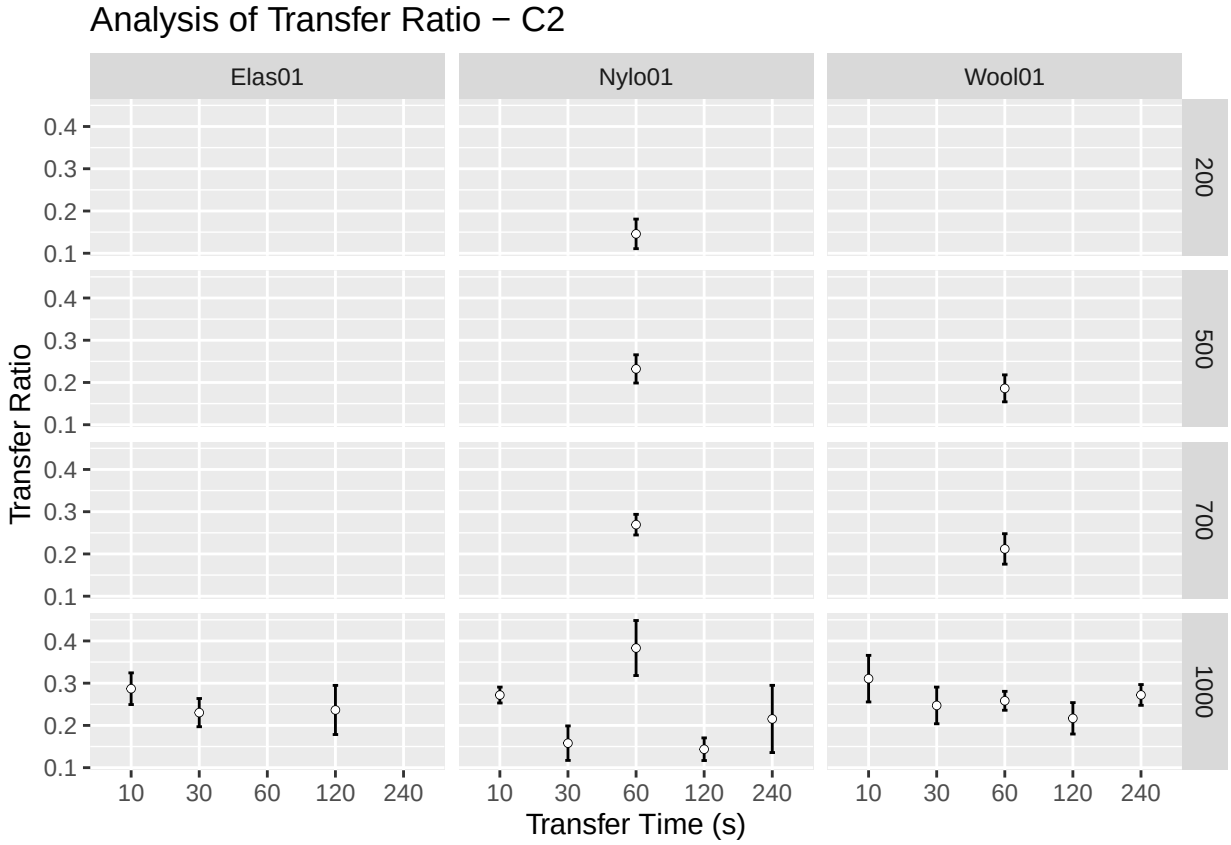
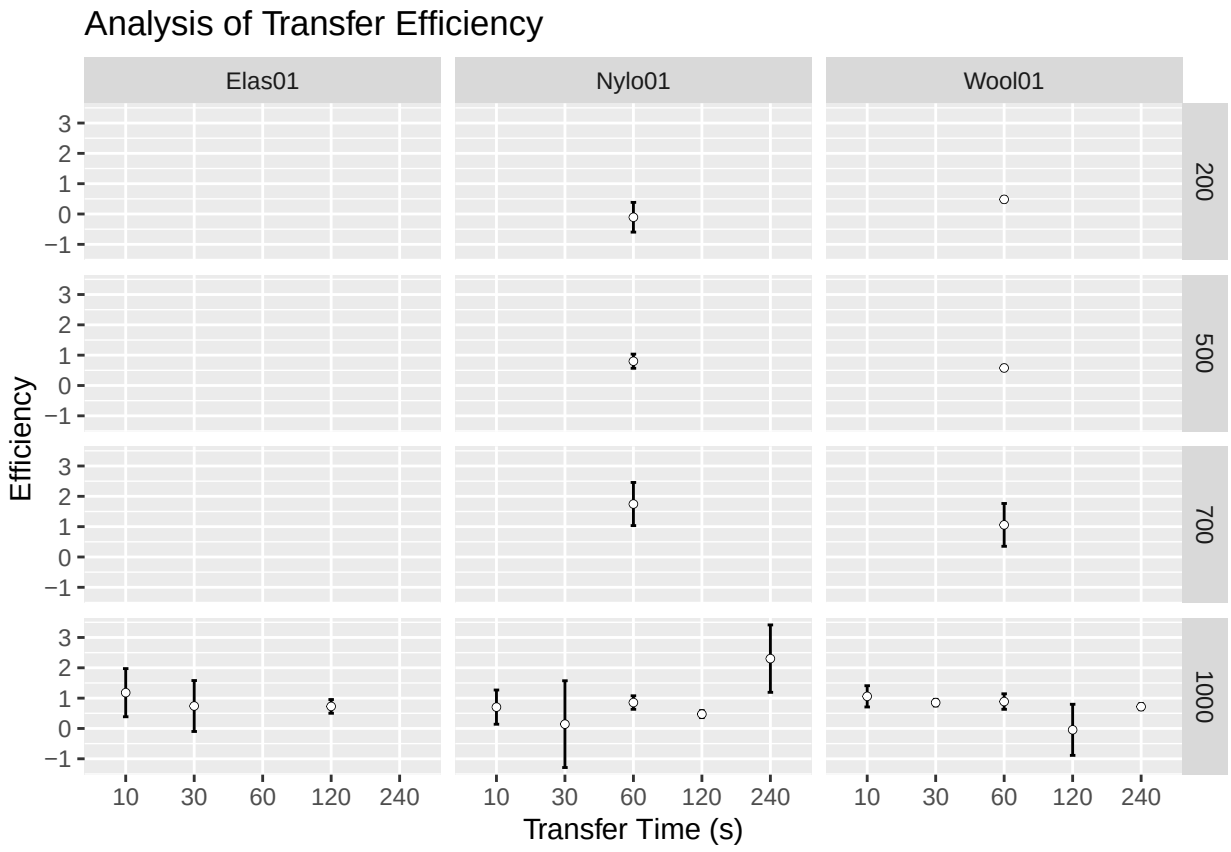

Analysis of Transfer Ratio − C2
Elas01
Nylo01
Wool01
200
500
700
1000
Transfer Ratio
0.4
0.3
0.2
0.1
10
30
60
120
240
Transfer Time (s)

Table 14: Efficiency data for E

| Mass | TransferTime | Substrate | N | Efficiency | sd | se | ci |
|---|---|---|---|---|---|---|---|
| 1000 | 10 | Elas01 | 12 | 1.1799508 | 2.7513425 | 0.7942442 | 1.7481197 |
| 1000 | 10 | Nylo01 | 6 | 0.7037990 | 1.3819488 | 0.5641783 | 1.4502664 |
| 1000 | 10 | Wool01 | 12 | 1.0591520 | 1.2141170 | 0.3504854 | 0.7714131 |
| 1000 | 120 | Elas01 | 4 | 0.7276411 | 0.4522614 | 0.2261307 | 0.7196488 |
| 1000 | 120 | Nylo01 | 10 | 0.4736985 | 0.3656422 | 0.1156262 | 0.2615646 |
| 1000 | 120 | Wool01 | 10 | -0.0448259 | 2.6642377 | 0.8425059 | 1.9058808 |
| 1000 | 240 | Nylo01 | 7 | 2.3025230 | 2.9409544 | 1.1115763 | 2.7199292 |
| 1000 | 240 | Wool01 | 12 | 0.7179882 | 0.3448847 | 0.0995596 | 0.2191293 |
| 1000 | 30 | Elas01 | 12 | 0.7402536 | 2.9102871 | 0.8401275 | 1.8491082 |
| 1000 | 30 | Nylo01 | 10 | 0.1426738 | 4.5237559 | 1.4305372 | 3.2361000 |
| 1000 | 30 | Wool01 | 10 | 0.8515502 | 0.3437273 | 0.1086961 | 0.2458877 |
| 1000 | 60 | Nylo01 | 15 | 0.8544468 | 0.8609351 | 0.2222925 | 0.4767700 |
| 1000 | 60 | Wool01 | 11 | 0.8870747 | 0.8488601 | 0.2559410 | 0.5702720 |
| 200 | 60 | Nylo01 | 12 | -0.1064671 | 1.6992670 | 0.4905361 | 1.0796628 |
| 200 | 60 | Wool01 | 3 | 0.4831126 | 0.1439292 | 0.0830976 | 0.3575401 |
| 500 | 60 | Nylo01 | 7 | 0.8017865 | 0.6161360 | 0.2328775 | 0.5698308 |
| 500 | 60 | Wool01 | 10 | 0.5780311 | 0.2817329 | 0.0890918 | 0.2015396 |
| 700 | 60 | Nylo01 | 12 | 1.7459928 | 2.4644839 | 0.7114352 | 1.5658583 |
| 700 | 60 | Wool01 | 9 | 1.0582959 | 2.1189461 | 0.7063154 | 1.6287661 |



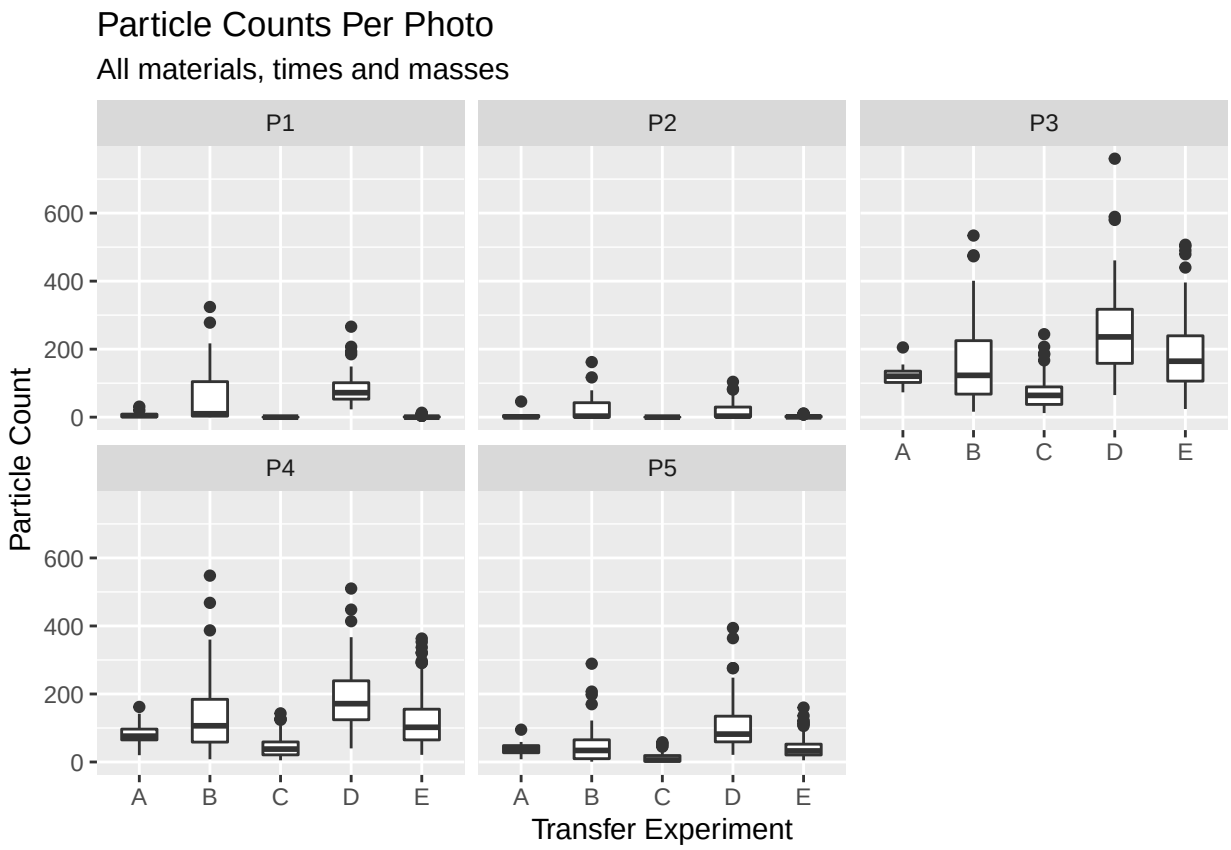
## Combined Analysis - counts

Currently all the photo count data is in wide format. Reformat into long format so we can do a comparison of particle counts per photo more easily.

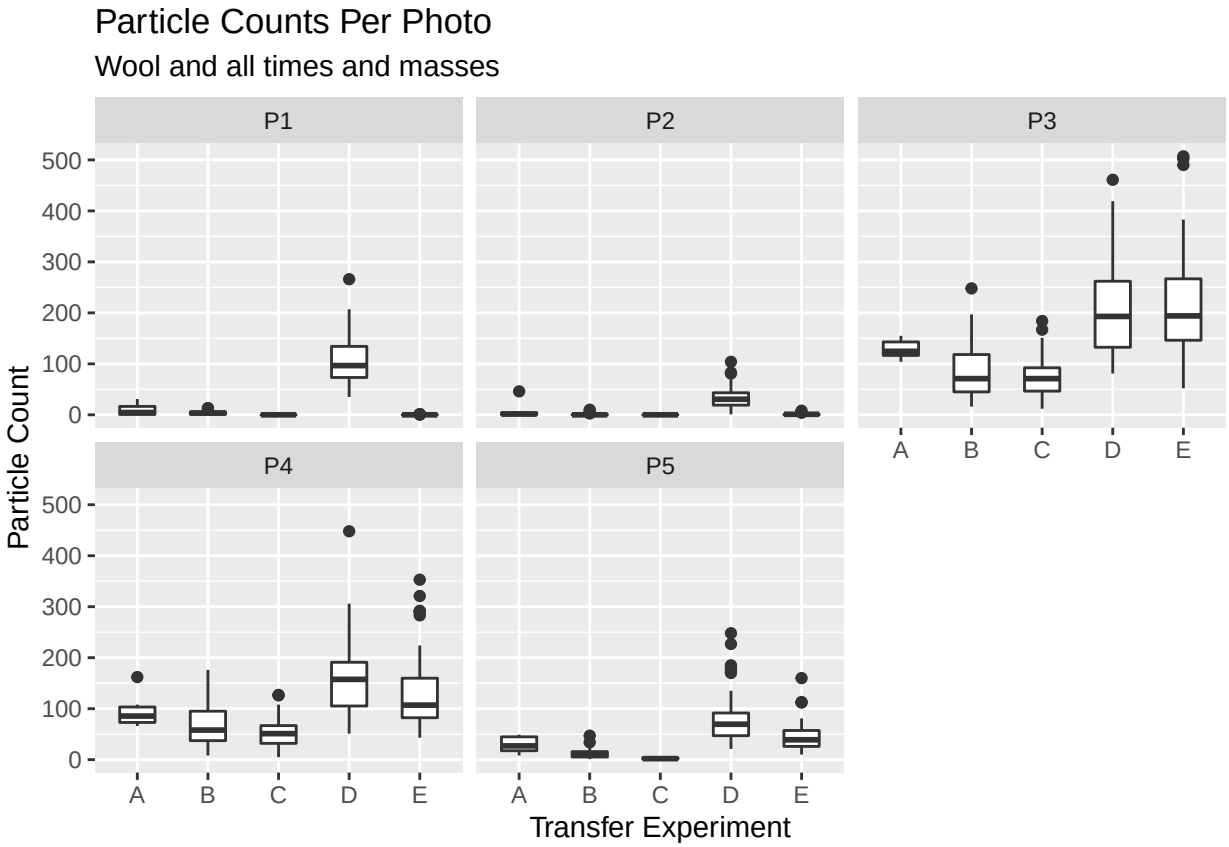
Firstly, look at all the data.

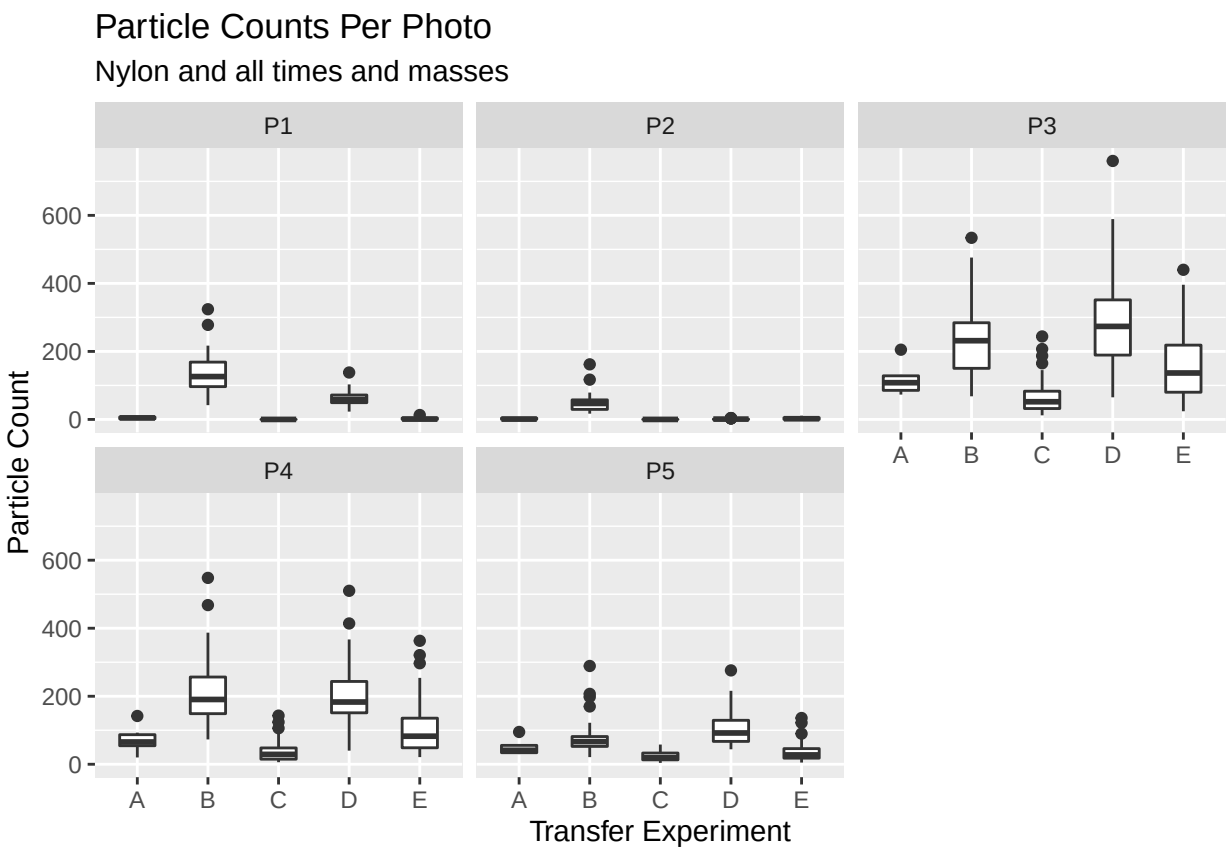
Table 15: Summary statistics of particle counts for each photo type by experiment

| Set | Mass | TransferTime | Substrate | Experiment | Replicate | photo | count |
|---|---|---|---|---|---|---|---|
| A | 1000 | 60 | Wool01 | 1 | 1 | P1 | 20 |
| A | 1000 | 60 | Nylo01 | 2 | 1 | P1 | 4 |
| A | 1000 | 60 | Wool01 | 1 | 2 | P1 | 31 |
| A | 1000 | 60 | Nylo01 | 2 | 2 | P1 | 10 |
| A | 1000 | 60 | Wool01 | 1 | 3 | P1 | 0 |
| A | 1000 | 60 | Nylo01 | 2 | 3 | P1 | 5 |
| A | 1000 | 60 | Wool01 | 1 | 4 | P1 | 0 |
| A | 1000 | 60 | Nylo01 | 2 | 4 | P1 | 1 |
| A | 1000 | 60 | Wool01 | 1 | 5 | P1 | 3 |
| A | 1000 | 60 | Nylo01 | 2 | 5 | P1 | 8 |

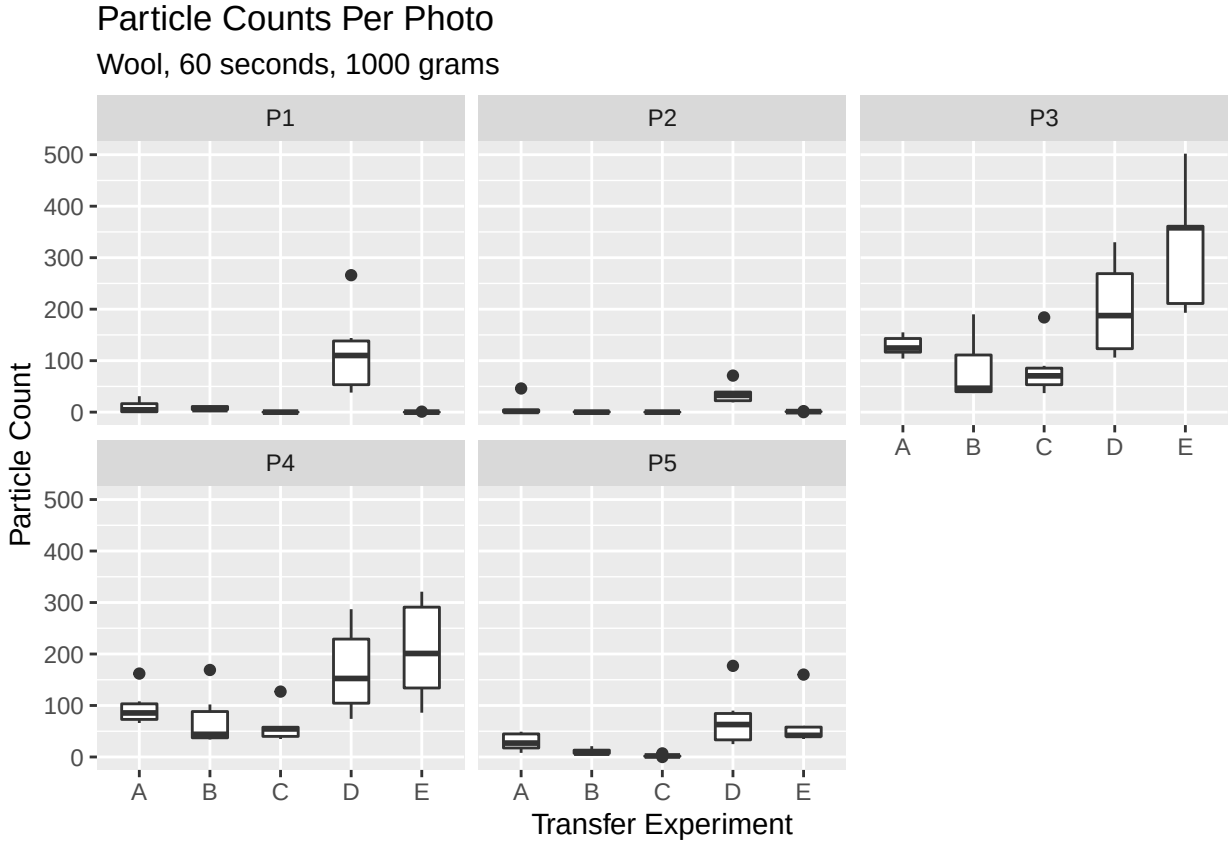


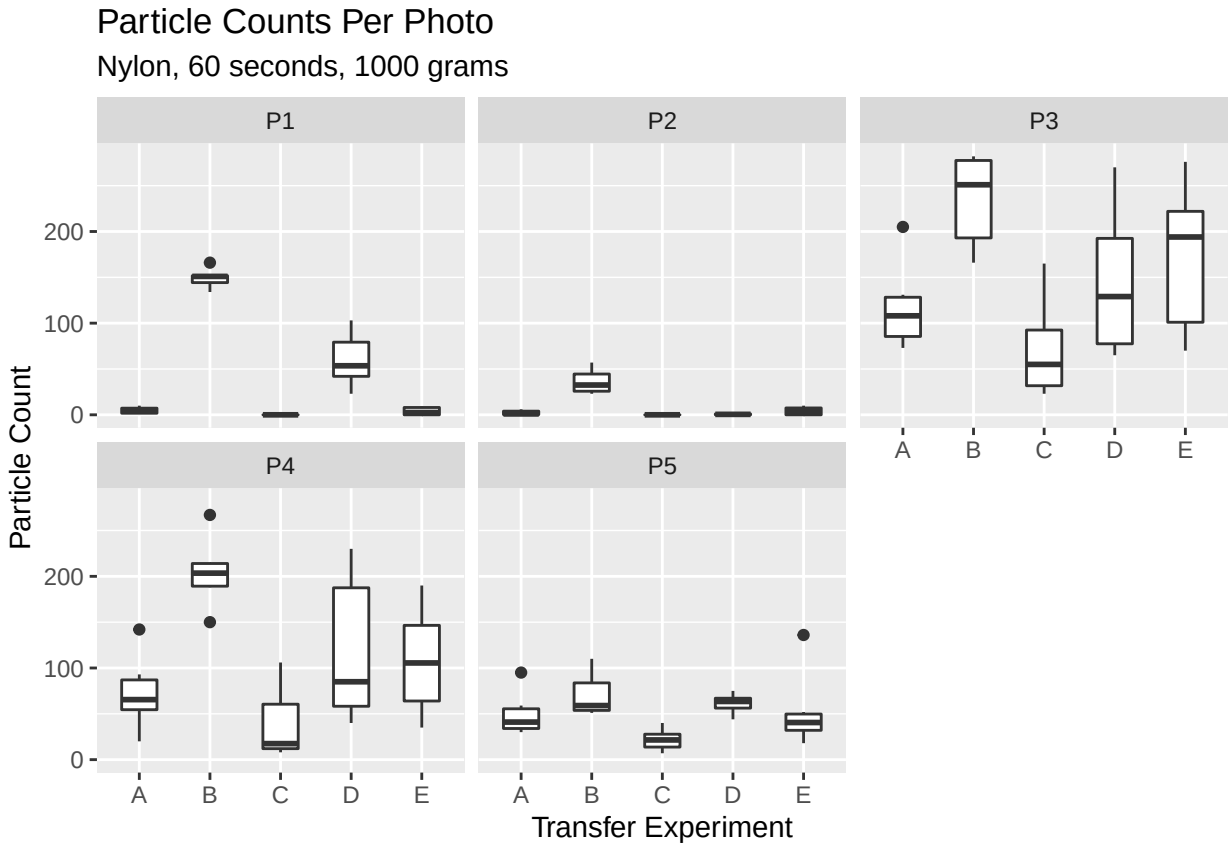

Now, let's see the difference between wool and nylon.


Particle Counts Per Photo
Wool and all times and masses
P1
P2
P3
P4
P5
Particle Count
0
100
200
300
400
500
A
B
C
D
E
Transfer Experiment

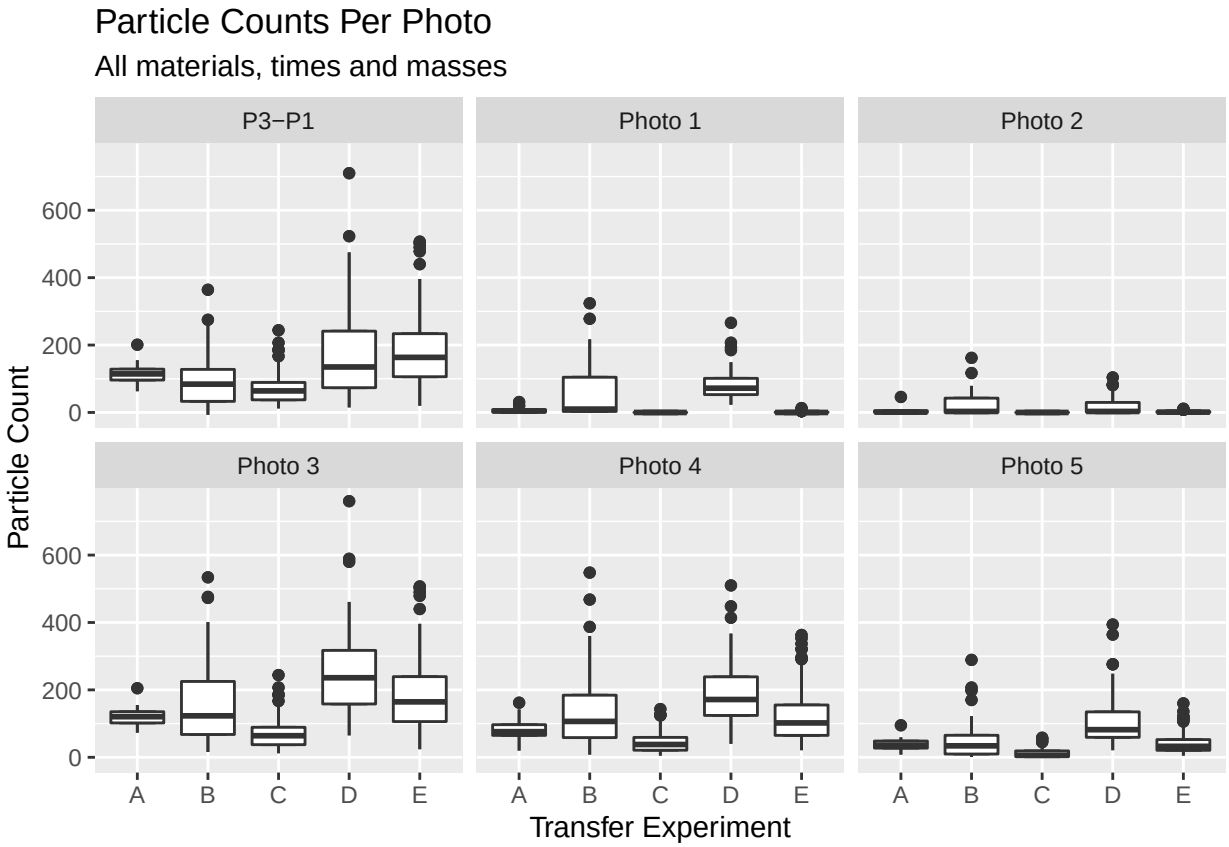

Particle Counts Per Photo
Nylon and all times and masses
P1
P2
P3
P4
P5
Particle Count
0
200
400
600
A
B
C
D
E
Transfer Experiment

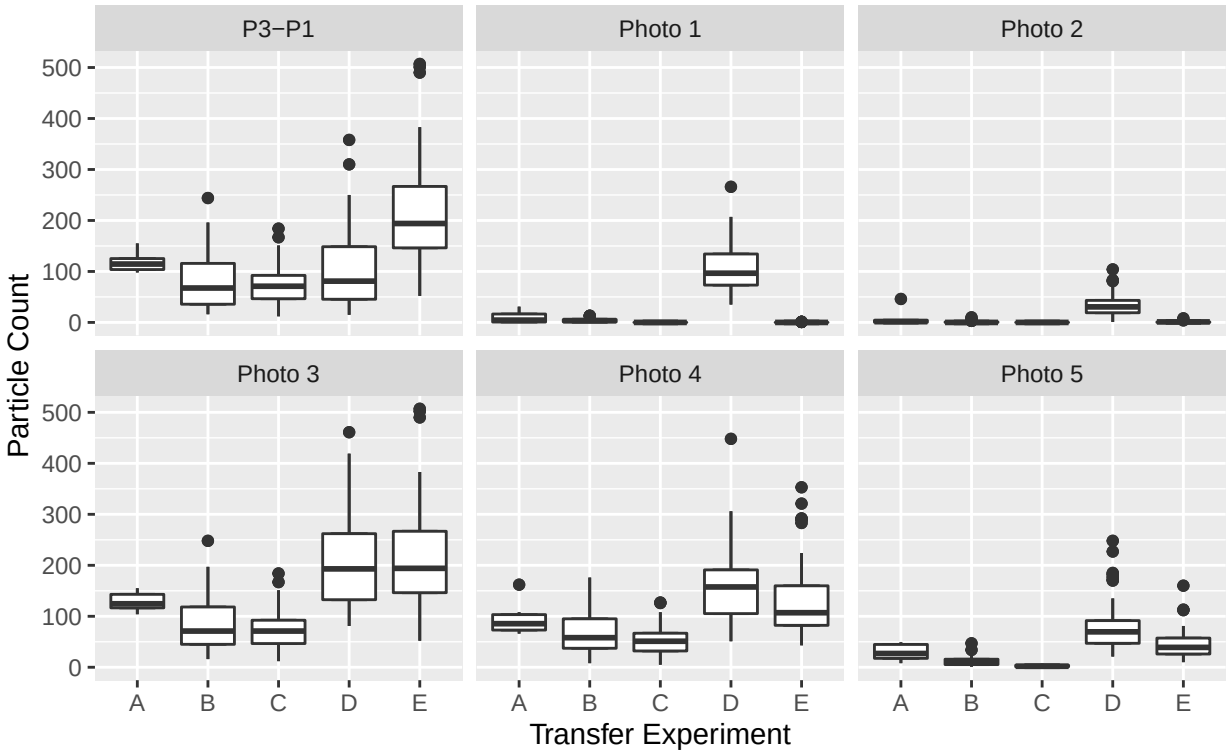
And, finally, wool and nylon for the ubiquitous 60 seconds and 1000 grams.






So a simulation (see the 'simul.Rmd' doc) suggests that when P3 - P1 approaches 0 the Transfer Ratio values go very high. Let's see what the distribution of P3 - P1 looks like in all our experiments.

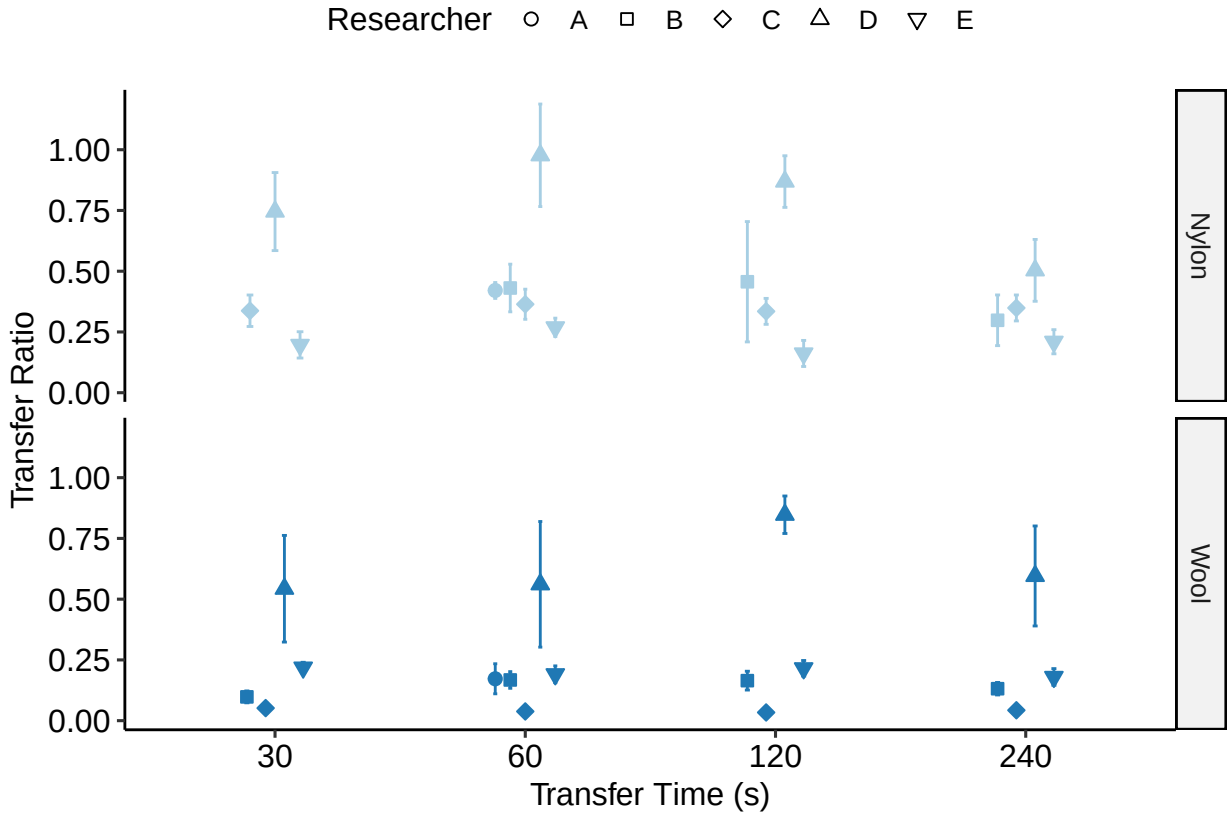

Particle Counts Per Photo
All materials, times and masses
P3−P1
Photo 1
Photo 2
Photo 3
Photo 4
Photo 5
Particle Count
0
200
400
600
A
B
C
D
E
Transfer Experiment

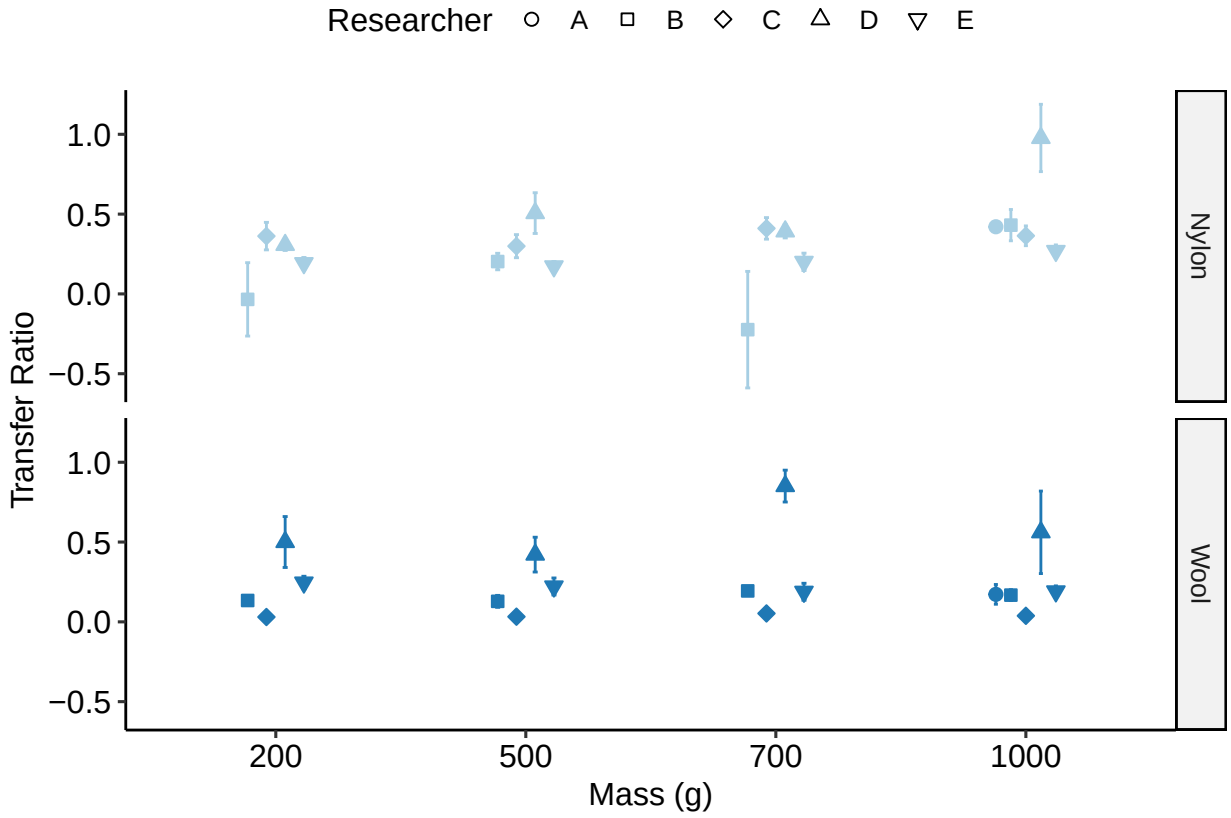

Particle Counts Per Photo
Wool, all times and masses
P3−P1
Photo 1
Photo 2
Photo 3
Photo 4
Photo 5
Particle Count
0
100
200
300
400
500
A
B
C
D
E
Transfer Experiment

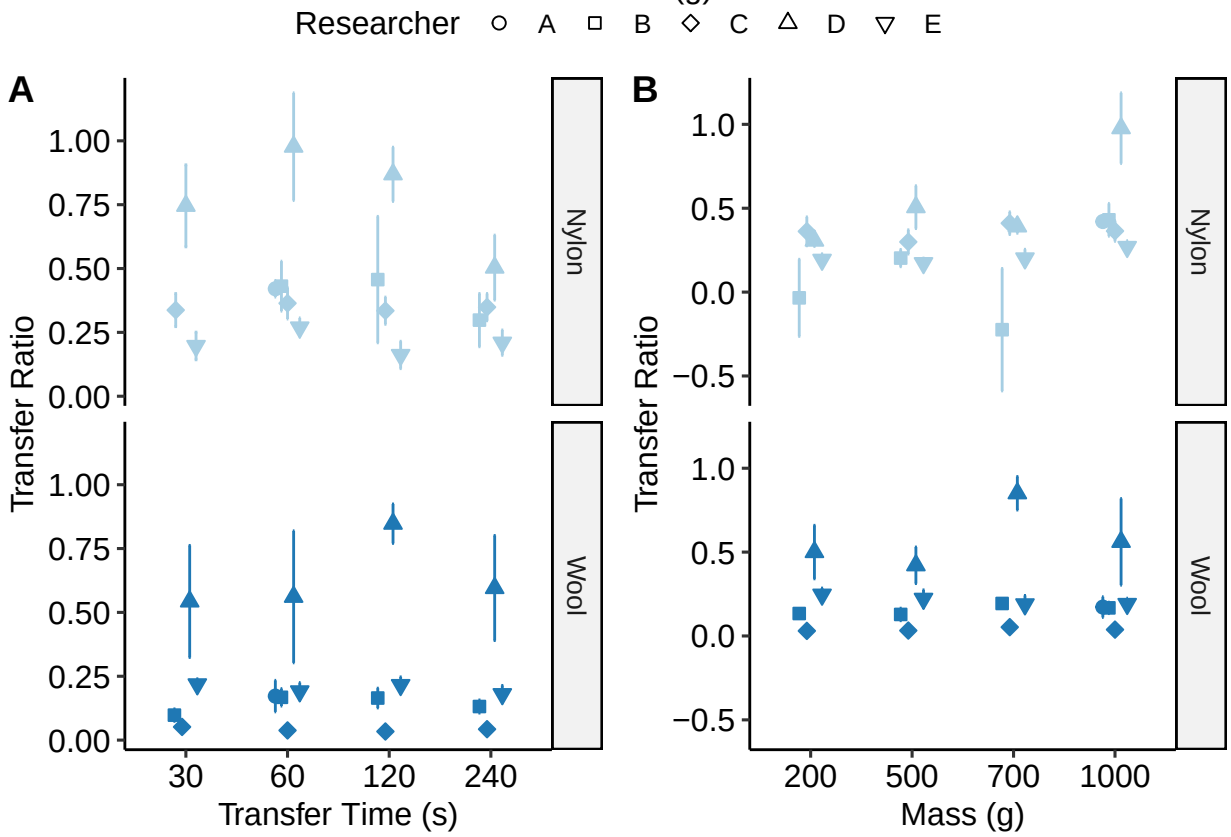
There are no standout differences between the experiment. Oh well...

### Combined Analysis - ratios

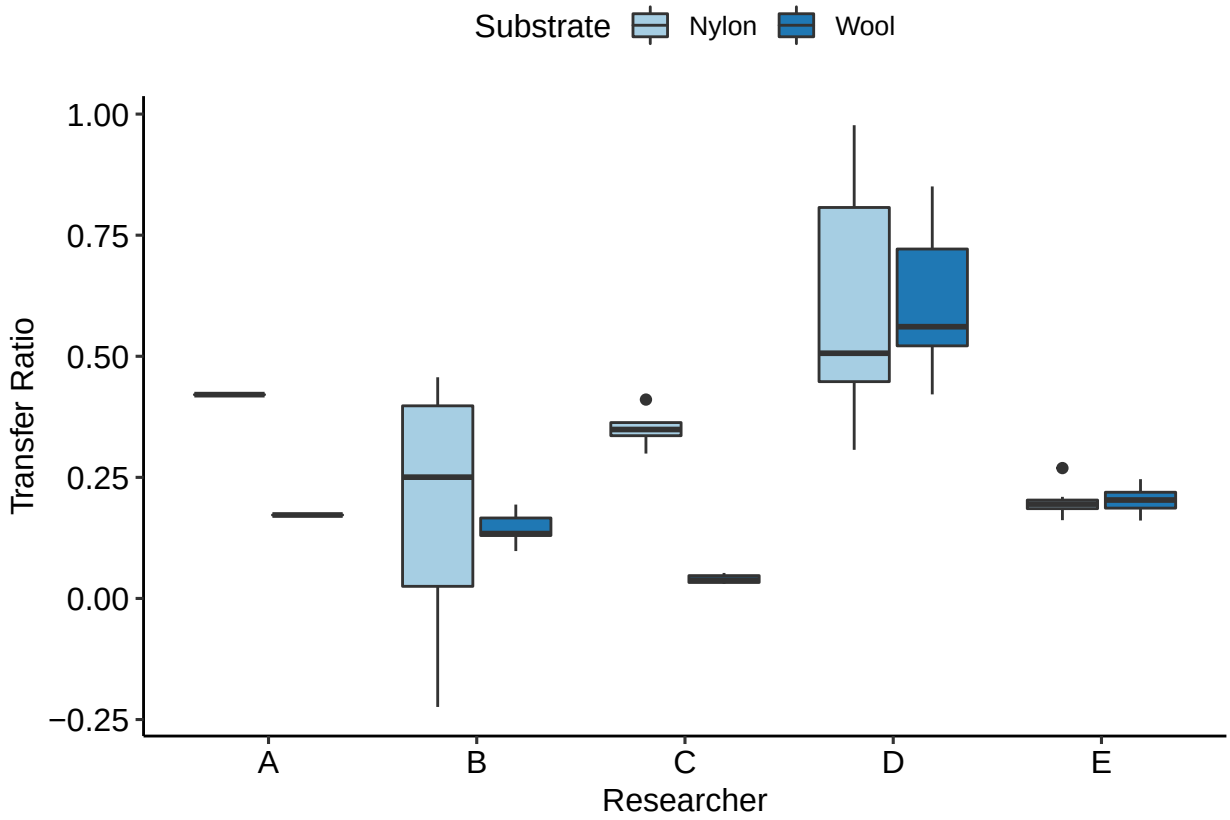
For the purposes of the paper let's look at the 1000g set for wool and nylon separately.



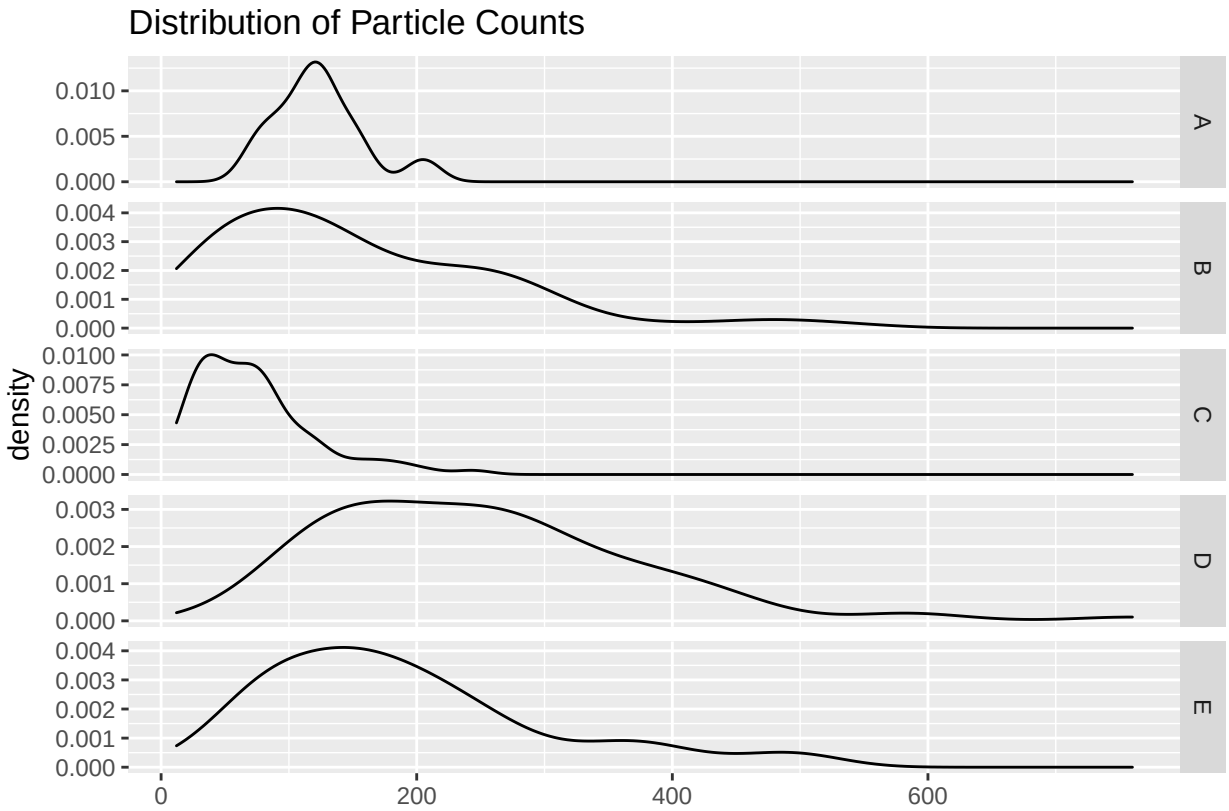


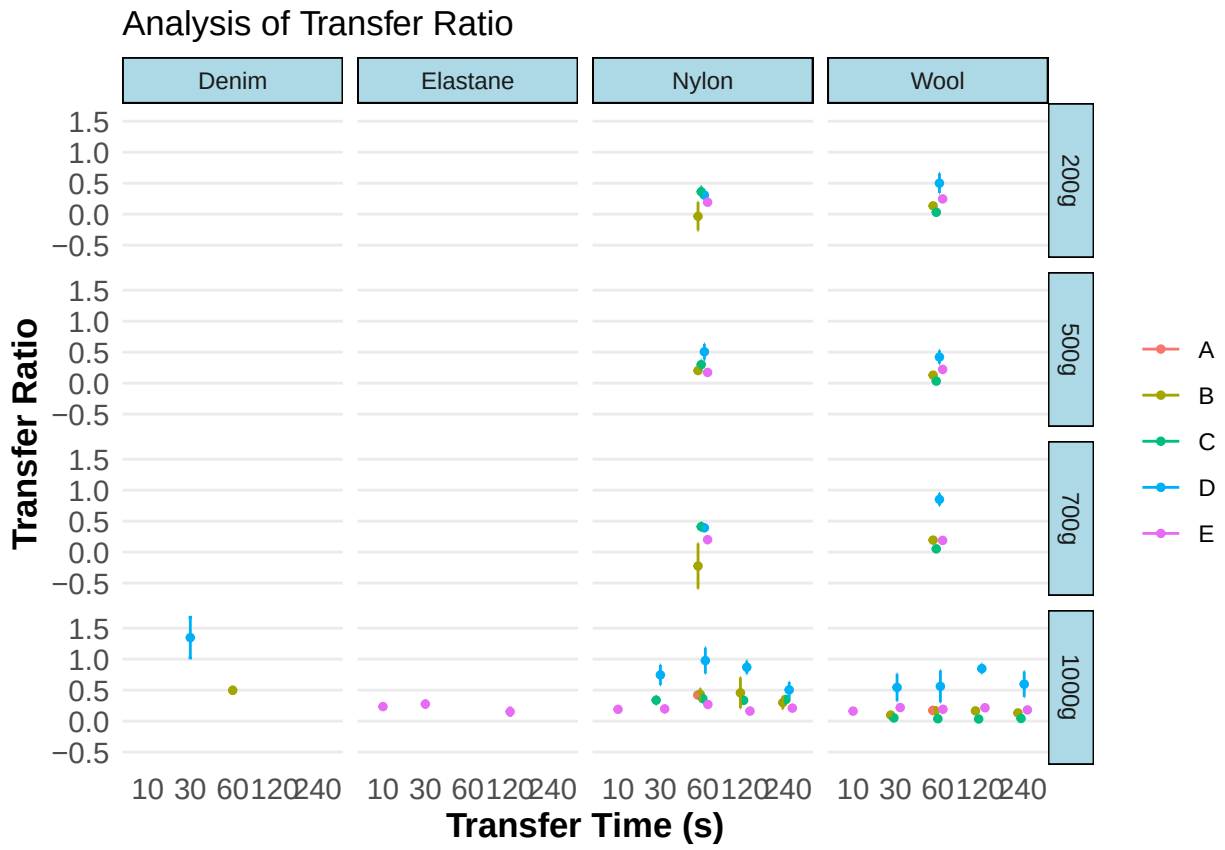




Seeing as there's very little effect from mass or time let's combine and see if receiver material has an effect.




What does the count data look like for a given photo?

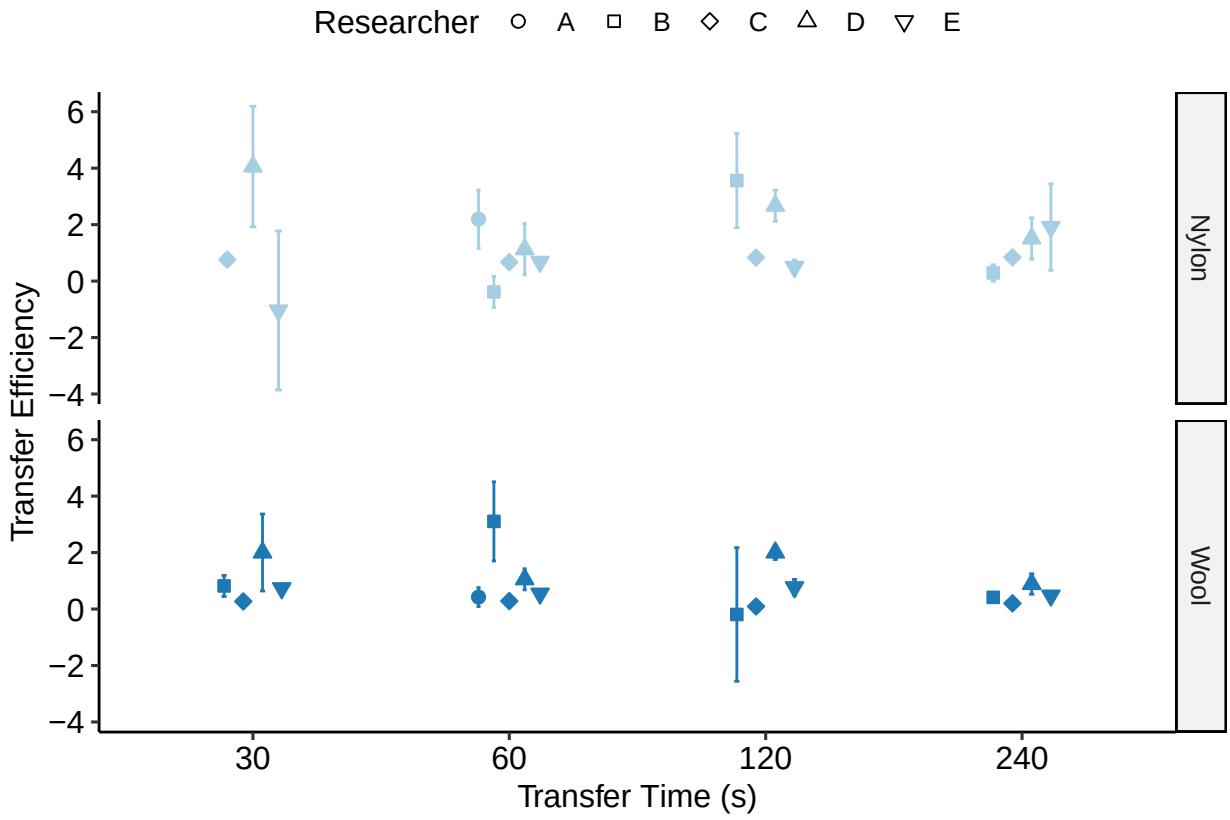


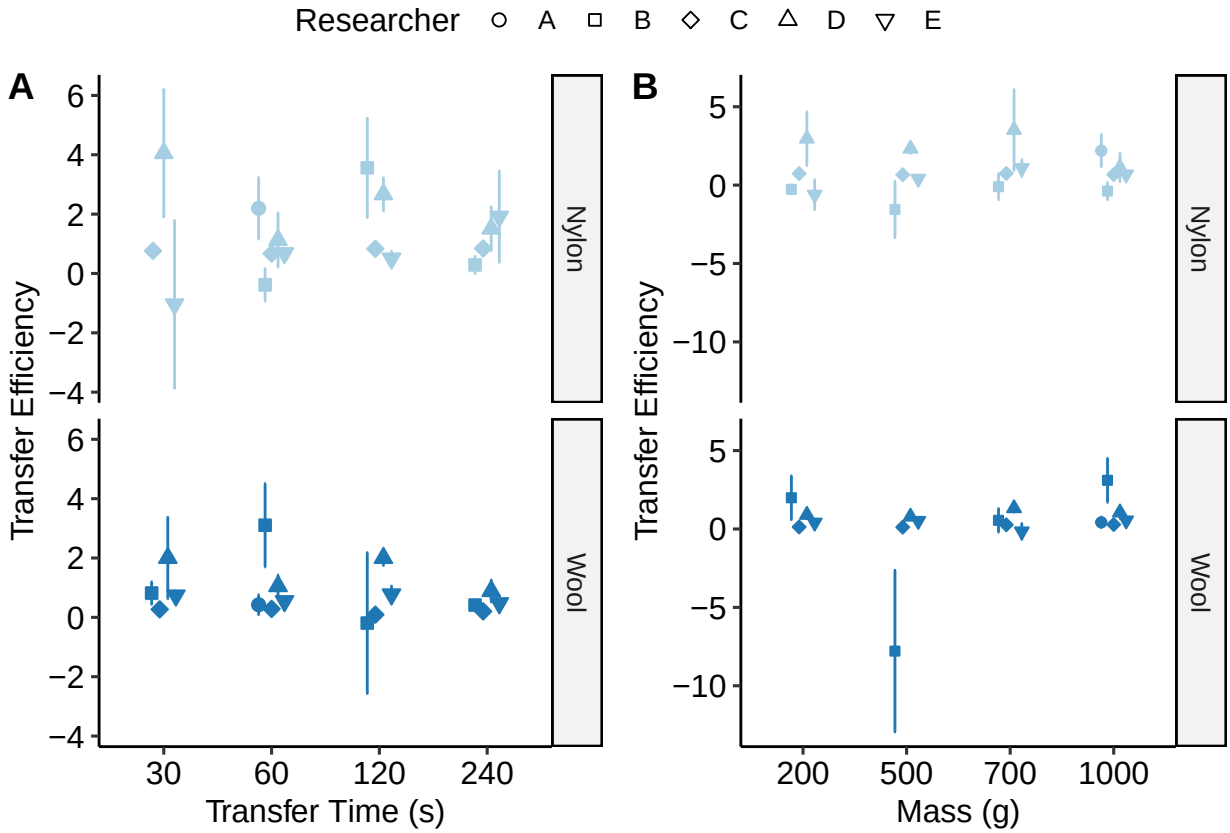


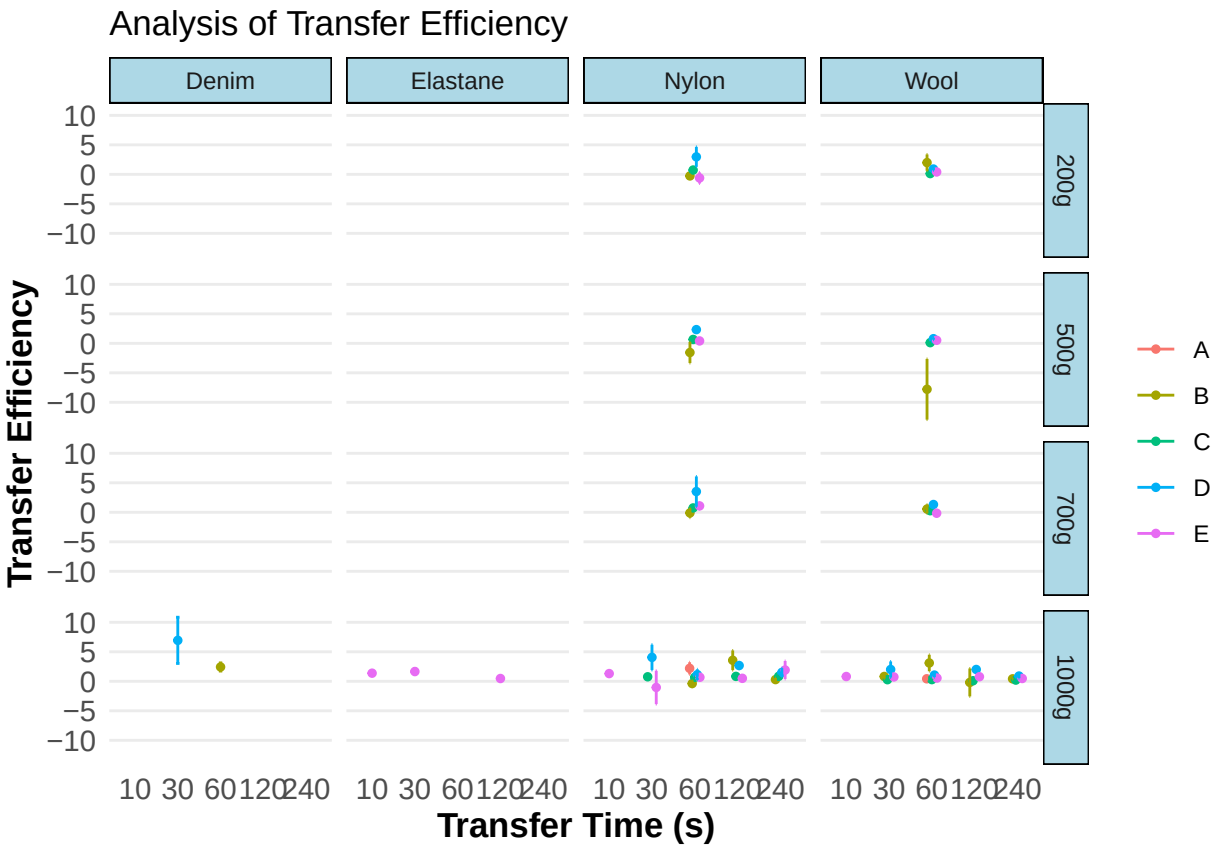

**Transfer Efficiencies**

A quick look at comparative transfer efficiency data.

Not sure what the transfer efficiency is showing here? What do values >1 mean, greater than 100% efficiency or what?


Researcher
A
B
C
D
E
Transfer Efficiency
Nylon
Wool
Transfer Time (s)
30
60
120
240


Researcher
A
B
C
D
E
A
B
Transfer Efficiency
Nylon
Wool
Transfer Time (s)
Mass (g)
200
500
700
1000


Analysis of Transfer Efficiency
Denim
Elastane
Nylon
Wool
200g
500g
700g
1000g
Transfer Efficiency
10
5
0
−5
−10
10 30 60 120 240
Transfer Time (s)
A
B
C
D
E