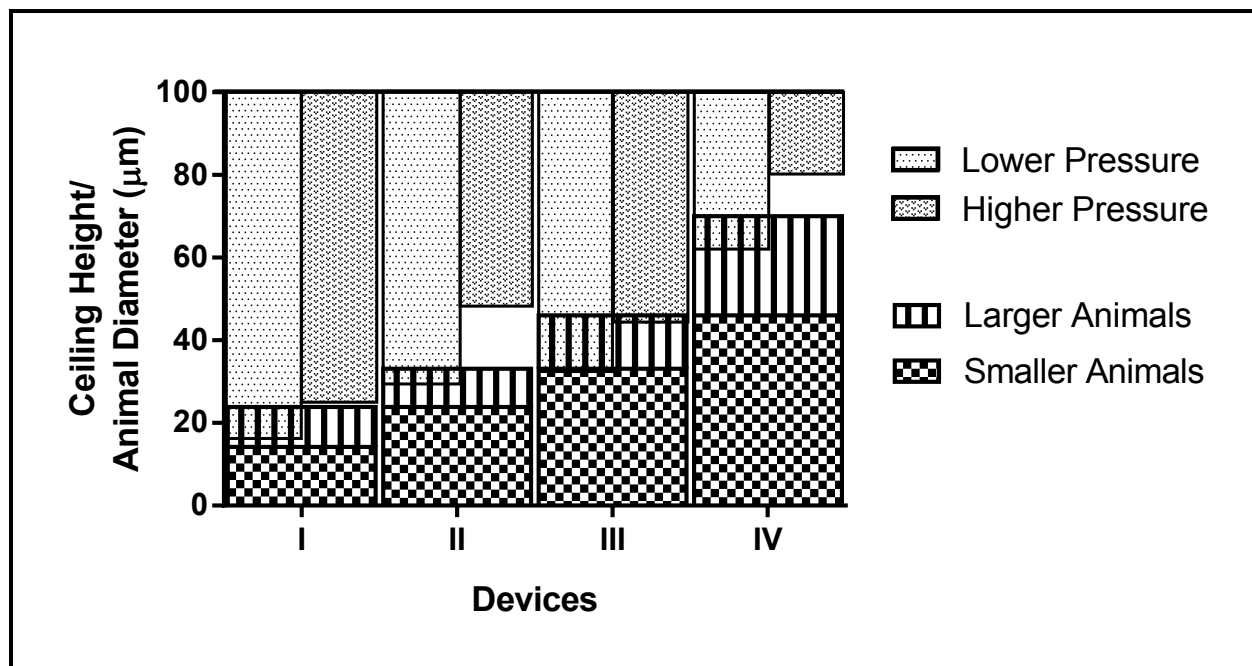


Supplementary Information



Supplementary Figure 1. Chamber ceiling heights at operational pressures superimposed on animals' body diameter for each device. The chamber heights were designed to be between the body diameter of the smaller and larger worms at loading phase (lower pressure) to help hinder the movement of the larger worms, but higher than both animals' diameter at releasing phase (higher pressure). The results validate intended design feature. At loading pressures of 3, 2, 5, and 5 psi for devices I, II, III, and IV, chamber heights were quantified to be 17.3 ± 1.6 , 29.4 ± 4.2 , 32.7 ± 5.6 , and 62.2 ± 5.8 μm , respectively. At releasing pressures of 11 psi, for devices I, II, III, and IV, chamber heights were quantified to be 24.4 ± 1.8 , 48.1 ± 3.6 , 44.1 ± 8.6 , and 83.3 ± 3.6 μm , respectively. The diameters for L1, L2, L3, L4 and Adult worms were measured to be 14.2 ± 2.4 , 23.9 ± 6.3 , 33.1 ± 5.2 , 46.0 ± 4.7 , and 70.0 ± 4.5 μm , respectively. Standard deviations were omitted on graphical representation for visual simplification. Values are expressed as mean \pm SEM, $n = 3$ for chamber height measurements and $n > 30$ for animal diameter measurements.

Supplementary Movie S1:

Sorting process of L1 and L2 stage larval mixture using optimized device I. All videos run at 4 times the actual speed.

Supplementary Movie S2:

Sorting process of L2 and L3 stage larval mixture using optimized device II.

Supplementary Movie S3:

Sorting process of L3 and L4 stage larval mixture using optimized device III.

Supplementary Movie S4:

Sorting process of L4 and Adult stage mixture using optimized device IV.

Supplementary Movie S5:

Sorting process of dauer and L4 stage mixture using optimized device III.