

Automated Yeast Counting and Viability using Cellometer

- Determine yeast concentration
- Determine yeast viability using fluorescent stains
 - Oxonol
 - Propidium Iodide



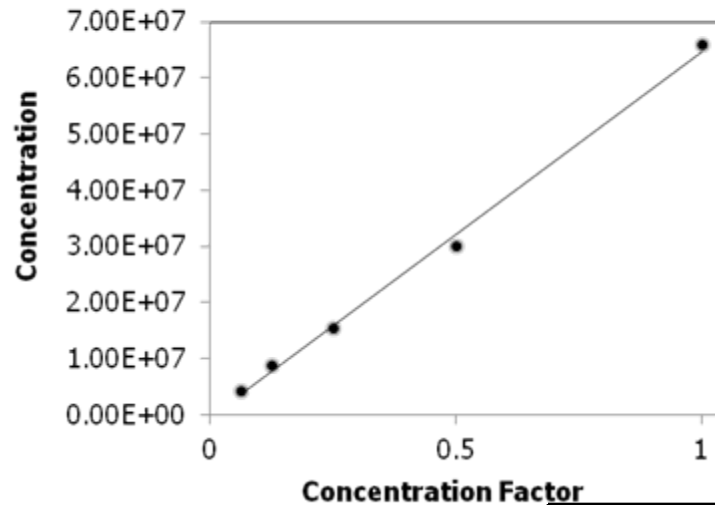
Automated Yeast Counting and Viability Applications

- Ethanol fermentation
 - Alcoholic beverages
 - Biofuels
- Yeast strain management
- Yeast strain development
- Research of pathogenic yeast
 - Human diseases
 - Crop diseases

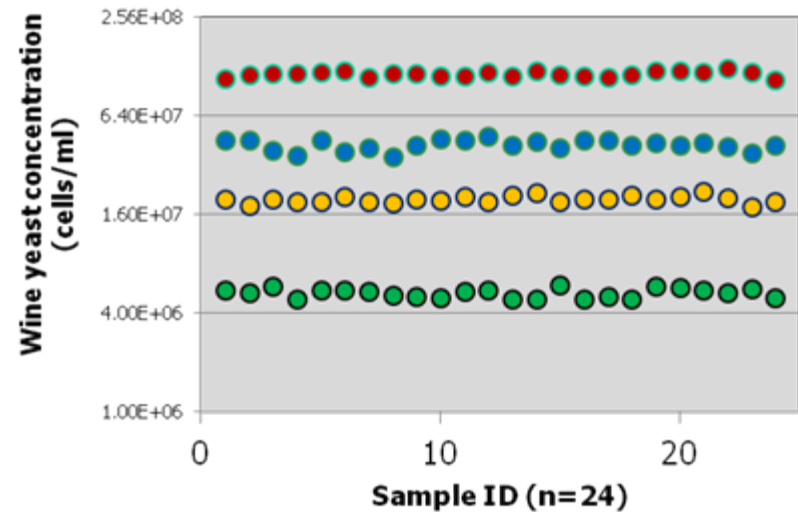


Validation of Concentration Measurements

Linear Range of Concentration Measurements



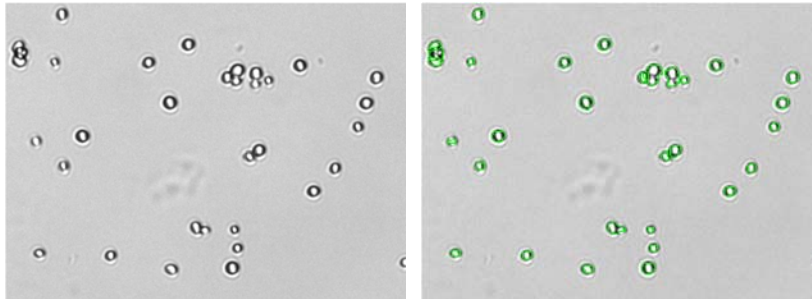
Consistency



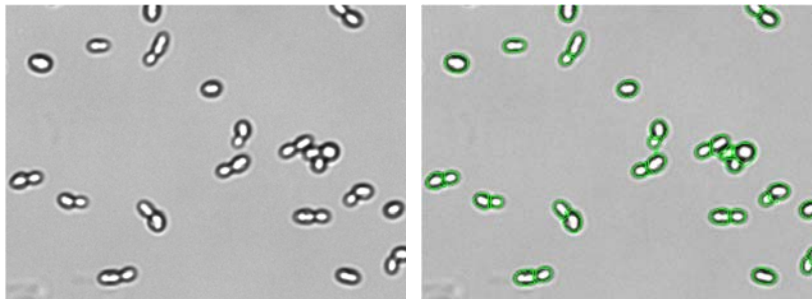
Dilution	Mean Concentration	CV
2	6.58E+07	6%
3	2.99E+07	4%
4	1.55E+07	7%
5	8.84E+06	10%
6	4.17E+06	13%



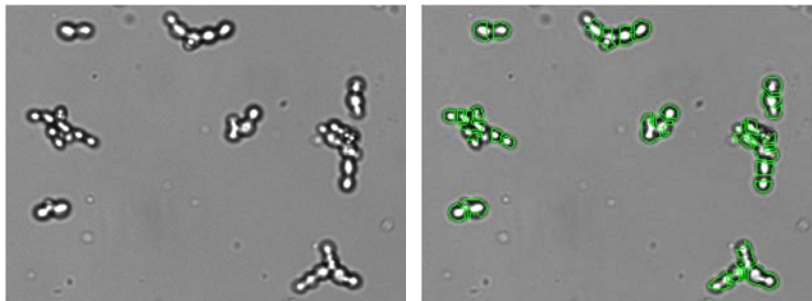
Yeast Morphologies Counted using Cellometer



Single-celled



Budding



Chain-forming



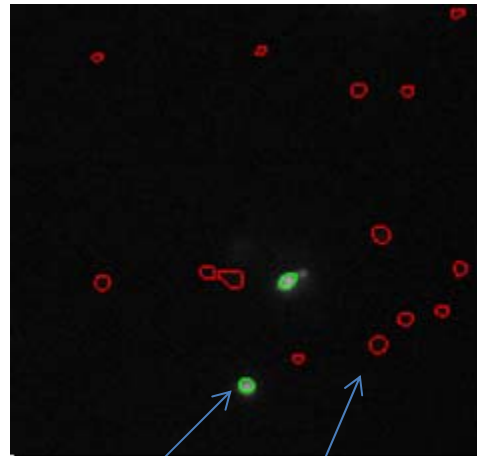
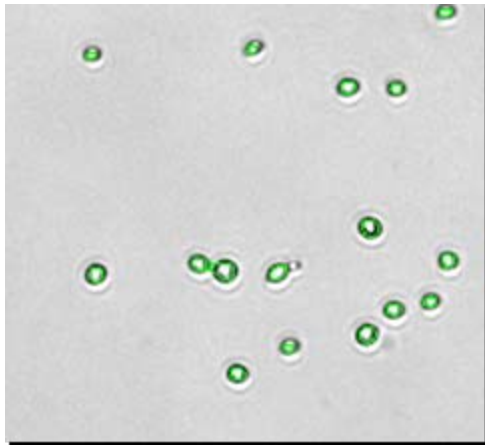
Yeast Viability Methods

- Total cells are counted in bright field, dead cells in fluorescence
- % viability determined by live/total cell number:
- Oxonol
- A green fluorescent membrane exclusion dye that enters dead cells more readily than live cells
- Propidium Iodide (PI)
- A red fluorescent membrane exclusion dye that enters dead cells but not live cells



Identify Live and Dead Cells and Determine Viability

Bright field used for total cells



dead

live

Counting Results

Sample: Muntons activated 2days + oxonol
Dilution: 1.0
Assay: Yeast Count Gallery Oxonol
Description: Viability with oxonol F101
Cell: Muntons activated
Description:

	Bright Field	Fluorescence
Count	2803	629
Mean Size	5.2	
Concentration	1.59×10^7	3.54×10^6

$$\frac{(BR - F1 \text{ Count})}{BR \text{ Total Count}} = 77.6\%$$

Export Print Done

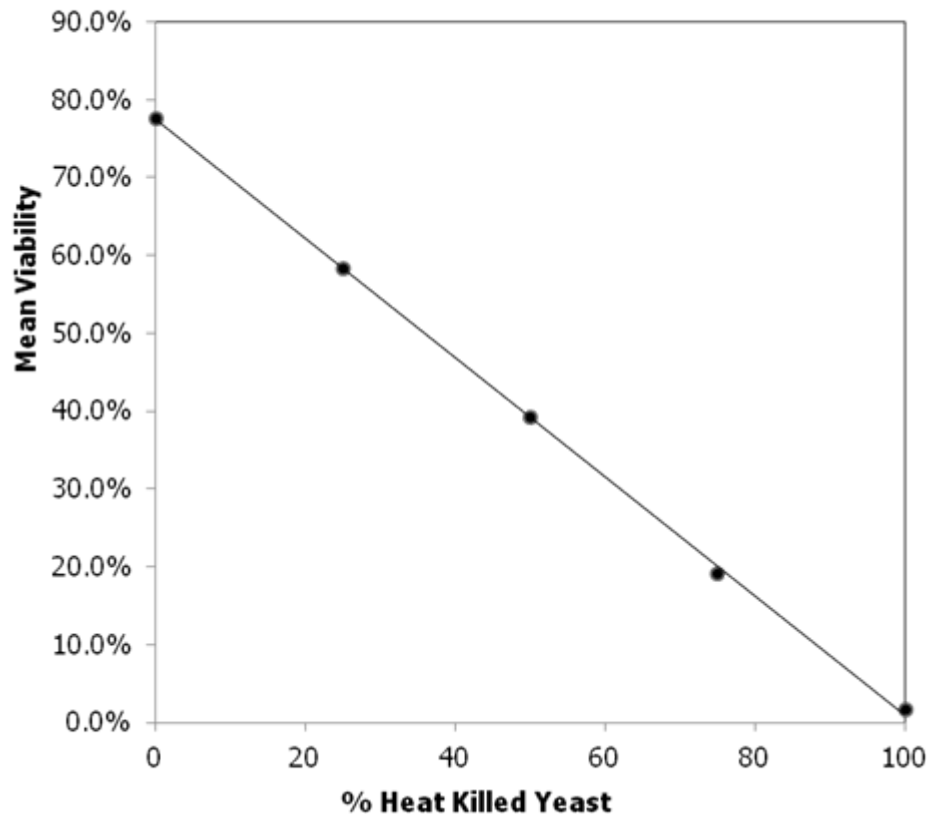
Show Size Distribution
Sample Adjustment
Set Data File
Save to Data File
View Data File

% Viability = live / total cells



Dynamic Range and Reliability of Viability Measurements on Cellometer Vision 10X

% Viability vs. %Dead cells Added



Live/Dead	Predicted	Measured	St Dev
100%/0%	-	78%	0.4%
75%/25%	59%	58%	1.2%
50%/50%	39%	39%	0.6%
25%/75%	20%	19%	1.3%
0%/100%	0%	0%	0.4%

