

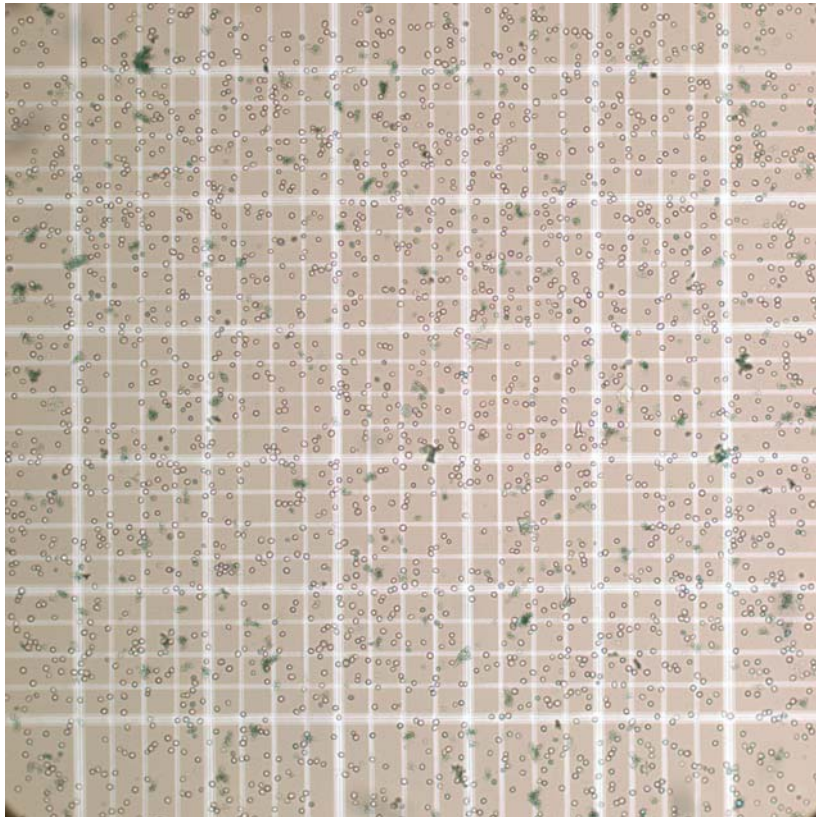
Cell Counting & Viability

White Labs

Lisa R. White

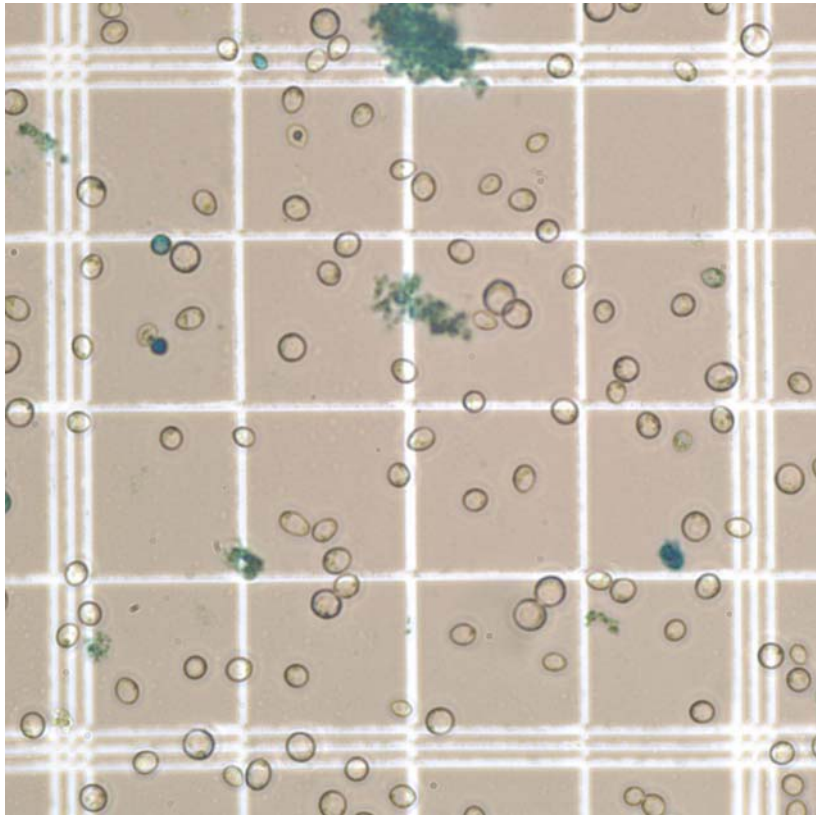
Pure Yeast & Fermentation

Hemocytometer- Full Grid



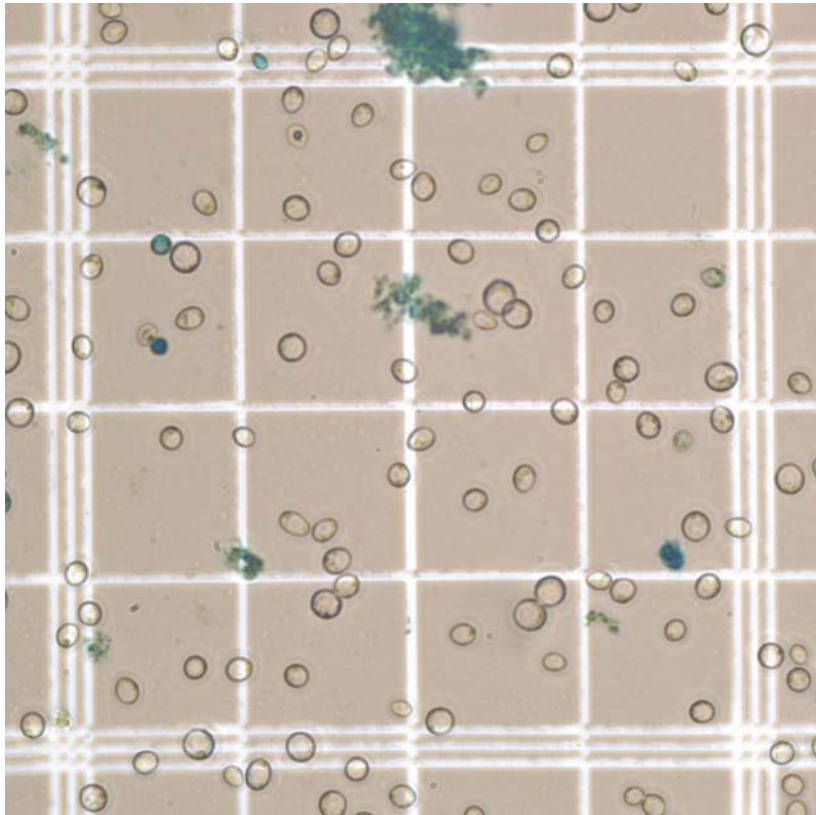
- This photo shows the 25 squares seen with the microscope at 10X power.
- Check for uniformity of cells. If okay, you can use the quick, 5 square method count.

Establishing a Counting Protocol



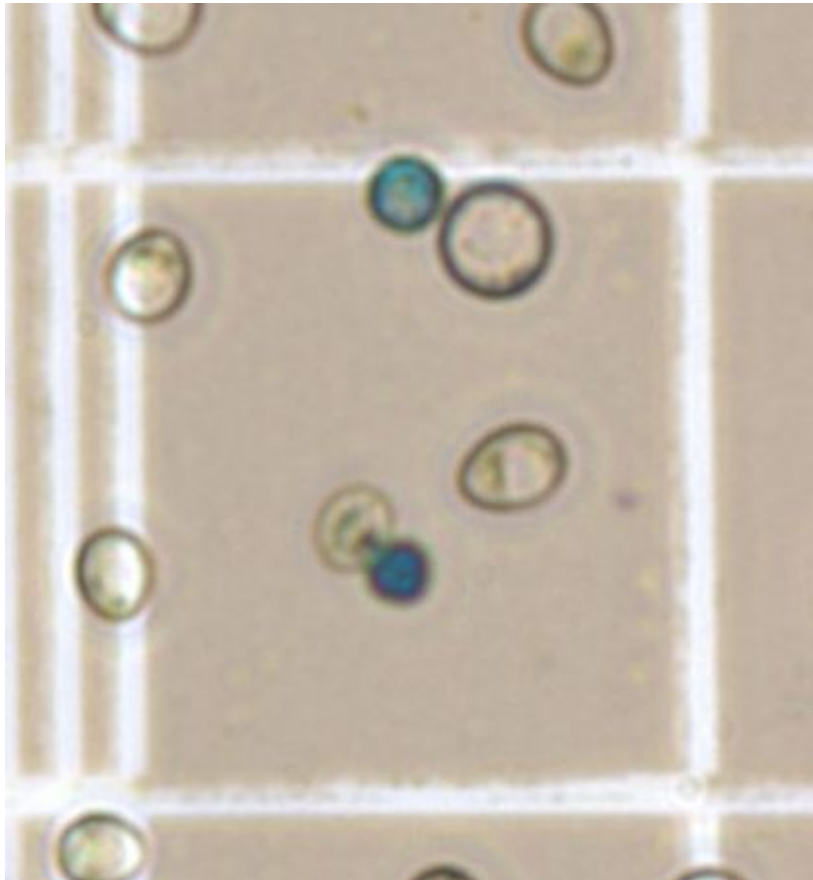
- Use the same counting protocol for all 5 squares- Cells touching or lying on the top and right triple boundary lines are not counted, whereas cells touching or lying on the bottom or left triple boundary lines are counted.
- Yeast buds emerging from the mother cell are counted as separate cells if the bud is at least one-half the size of the mother.

Other notes



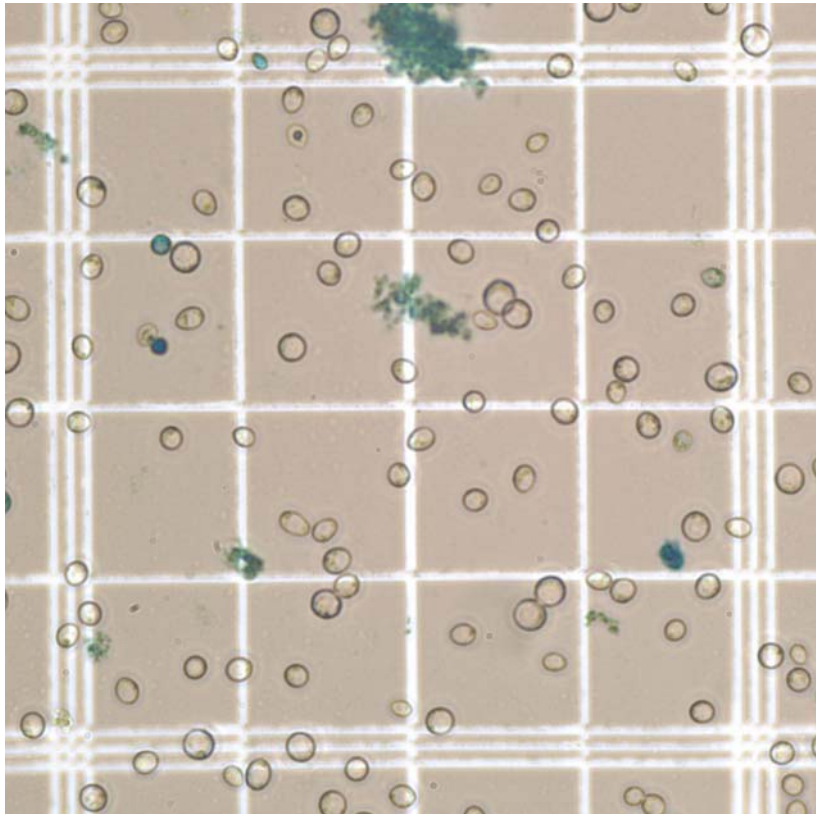
- Yeast cells are easily seen at 40X power.
- You may also notice trub in your viewing field that may stain.
- Trub can be seen in this square at top center and mid center.

Viability protocol



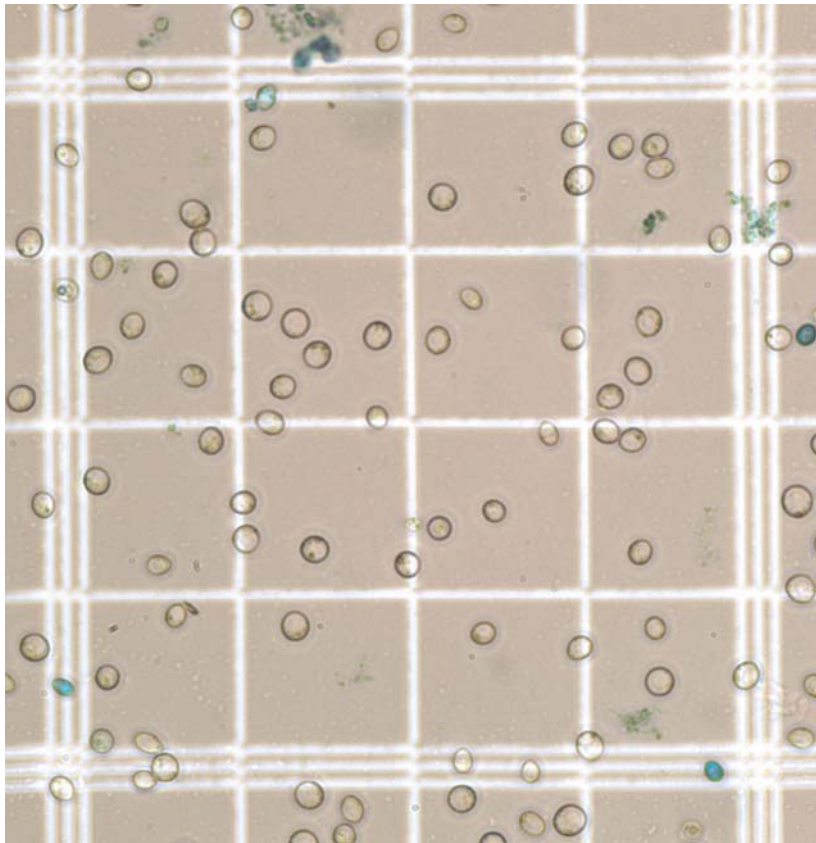
- Dead cells will stain dark blue
- Cells that are clear or pale blue in color are considered alive.
- Some budding cells will stain dark blue, but they are not dead! Buds are busy with growing metabolism and not extruding the dye.

Square #1



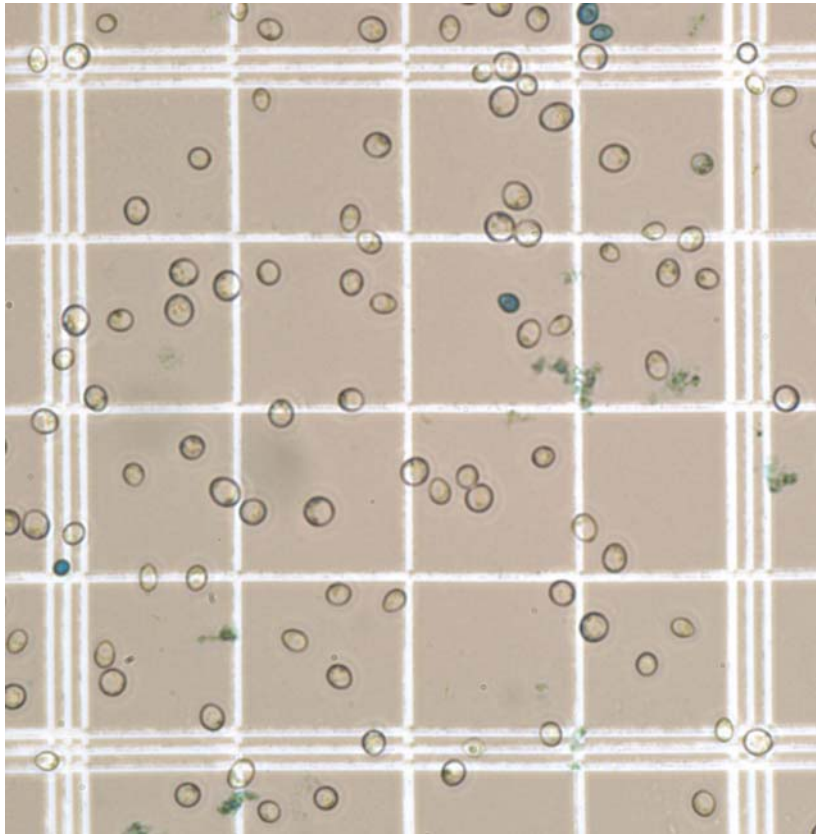
- Keeping with the counting protocol, you should have counted:
- Total cells: 69
- Dead cells: 1

Square #2



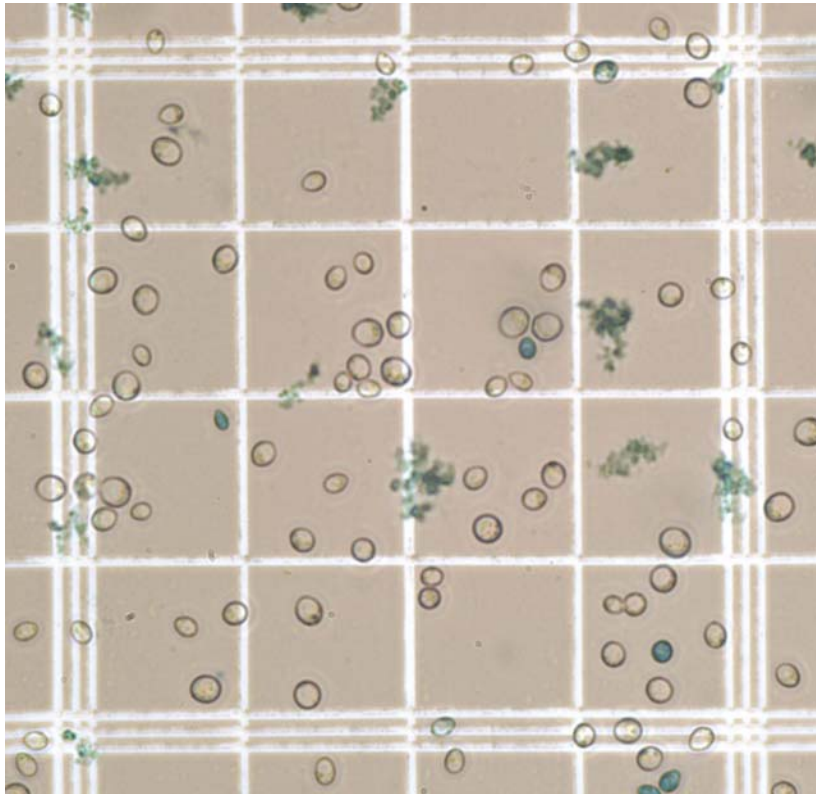
- Keeping with the counting protocol, you should have counted:
- Total cells: 58
- Dead cells: 2

Square #3



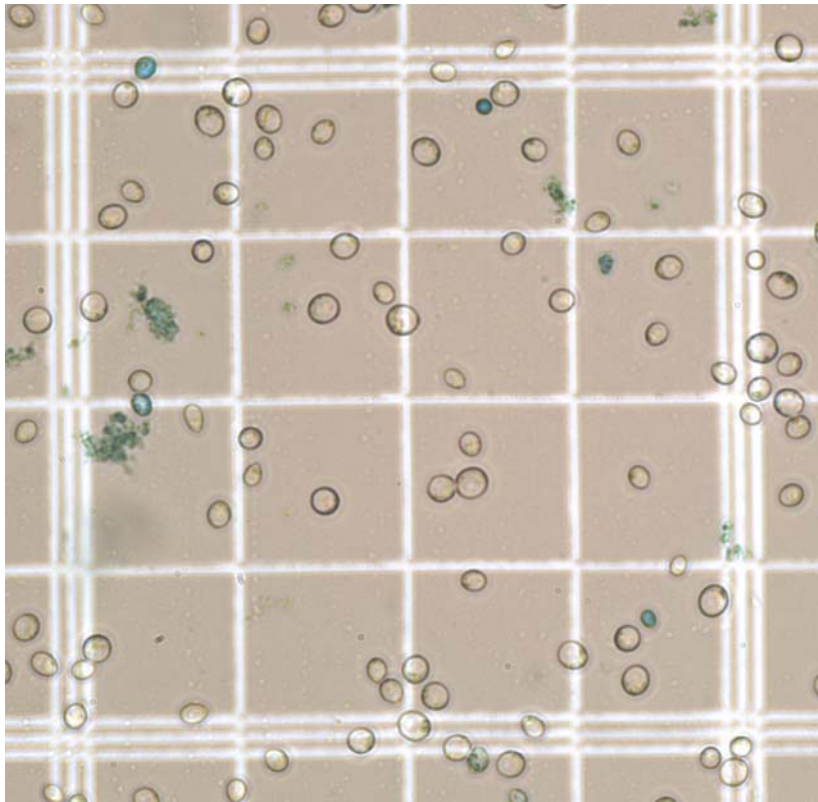
- Keeping with the counting protocol, you should have counted:
- Total cells: 64
- Dead cells: 2

Square #4



- Keeping with the counting protocol, you should have counted:
- Total cells: 61
- Dead cells: 2

Square #5



- Keeping with the counting protocol, you should have counted:
- Total cells: 50
- Dead cells: 0

Calculating Your Cell Count

- Take the total # of cells you counted in the 5 squares. In this case= 302
Multiply cells 5 squares by 5 to generate the number of cells in 25 squares → $302 \times 5 = 1,510$
- Determine your dilution factor of your sample. In this case= 1:100
- Volume in Hemacytometer chamber is 1/10,000 ml
- *Yeast cells/ml = Total cells in 25 squares x dilution factor x (1×10^4)*
- **$1,510 \times 100 \times (1 \times 10^4) = 1.51 \times 10^9$ or 1.51 billion cells/ml**

Calculating Your Yeast Viability

- *# of live cells ÷ total number of cells x 100% = viability percentage.*
- In this example: 7 dead cells total
 - $295 \div 302 \times 100\% = 97.7\%$ viable