

## RATE OF INCREASE IN ACETOBACTER CELLS OVER TIME

Acetobacter - the principle organism responsible for spoilage (and for turning wine into vinegar) doubles its numbers every 20 minutes in the right circumstances. Just one cell, then, can very quickly lead to spoilage of real ales. The table below gives you some idea what happens when one cell infects your beer at 6.00pm. By next evening you'll have

2,361,183,241,434,820,000,000 of them. Theoretically.

Hours	Minutes	Number of cells
	0	1
6pm	20	2
	40	4
	0	8
7pm	20	16
	40	32
	0	64
8pm	20	128
	40	256
	0	512
9pm	20	1,024
	40	2,048
	0	4,096
10pm	20	8,192
	40	16,384
	0	32,768
11pm	20	65,536
	40	131,072
	0	262,144
Midnight	20	524,288
	40	1,048,576
	0	2,097,152
1am	20	4,194,304
	40	8,388,608
	0	16,777,216
2am	20	33,554,432
	40	67,108,864
	0	134,217,728
3am	20	268,435,456
	40	536,870,912
	0	1,073,741,824
4am	20	2,147,483,648
	40	4,294,967,296
	0	8,589,934,592
5am	20	17,179,869,184
	40	34,359,738,368
	0	68,719,476,736
6am	20	137,438,953,472
	40	274,877,906,944
	0	549,755,813,888
7am	20	1,099,511,627,776
	40	2,199,023,255,552
	0	4,398,046,511,104
8am	20	8,796,093,022,208
	40	17,592,186,044,416
	0	35,184,372,088,832
9am	20	70,368,744,177,664
	40	140,737,488,355,328
	0	281,474,976,710,656
10am	20	562,949,953,421,312
	40	1,125,899,906,842,620
	0	2,251,799,813,685,250
11am	20	4,503,599,627,370,500
	40	9,007,199,254,740,990
	0	18,014,398,509,482,000
Noon	20	36,028,797,018,964,000
	40	72,057,594,037,927,900
	0	144,115,188,075,856,000
1pm	20	288,230,376,151,712,000
	40	576,460,752,303,423,000
	0	1,152,921,504,606,850,000
2pm	20	2,305,843,009,213,690,000
	40	4,611,686,018,427,390,000
	0	9,223,372,036,854,780,000
3pm	20	18,446,744,073,709,600,000
	40	36,893,488,147,419,100,000
	0	73,786,976,294,838,200,000
4pm	20	147,573,952,589,676,000,000
	40	295,147,905,179,353,000,000
	0	590,295,810,358,706,000,000
5pm	20	1,180,591,620,717,410,000,000
	40	2,361,183,241,434,820,000,000