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|  | Monday 1/26/98 Teacher Working Day  We came in and prepared the media. First, though we had to go out to get bleach @ Safeway. We mixed a 25% bleach 75% tap water mixture to wash off all the table tops we used for out experiment. We plan to do that every time we work on the experiment. Then we sterilized one 2000ml beaker, 1 200-ml beaker, 20 test tubes, and the mortar and pestle using the sterilizer no one had used before. We just followed the directions given on the front panel. We then prepared the medium and poured it into 46 petri dishes keeping them sterile by covering them after pouring. Then we spread the bacteria on 2 dishes, which we put into the autoclave set @ 34( C. Medium (Agar Tryptic Soy) smelled salty and a little putrid. The rest of the petri dishes were put in the vent.  Tuesday 1/27/98 After School  We perfected the obtaining of garlic juice today and added different concentrations as indicated by our original plan. We already have altered our original procedures quite a bit. The growing bacteria produced a layer of steam on the covers of the petri dishes - very annoying - and when opening the dishes to observe an offensive odor is present. Maybe the bacteria are respiring.  Wednesday 1/28/98  Results after the first trial and deductions  ABCD layer of bacteria is thinner than where there is no garlic. The lower the concentration, the smaller the area where there is less bacteria.  Probable cause - the water evaporated leaving only garlic juice. The more water there is the less garlic juice, so the area the juice did spread to has fewer bacteria.  We found out our method of testing was inefficient and no numerical results could be obtained.  We will try to use the chromatography paper next and try to measure the inhibition zones.  Today was disappointing overall. Also more bad news. Small colonies of other bacteria are starting to grow on the supposed "sterile" agar plates. We put them into the refrigerator (thanks to our science teacher).  Thursday 1/29/98  Our trial run: to determine better procedures  Time in  4:07  What we did:  We added full strength garlic juice to the chromatography paper (soaked paper in garlic juice). We also soaked chromatography paper in distilled water to contrast reactions.  Friday 1/30/98  Observation: A visible inhibition area around garlic soaked disks was there. They were about 2 cm wide. No inhibition zone around the distilled water soaked disks. (Even had bacteria growing on the disks)  Monday 2/2/98  We observed out "trial run" of 1/29/98 again and as expected, the bacteria began to grow into the inhibition area. We believed that the allicin of the garlic, the supposed component that kills bacteria has slowly stopped working. There are still fewer colonies around the disks of garlic.  Today we began our "actual" experiment using the different concentrations as originally decided. (Data is on data table) We prepared five trials. Over the weekend I had though to trying to also test the antibiotics normally used for this bacteria, but after some research (asking my uncle, a doctor) I found it not possible. (Big companies do it instead). We will try to obtain data of inhibition areas so we can compare our data with there and see if garlic is an effective antibiotic. Also thought of researching decline of current antibiotics.  Tuesday 2/3/98  This morning we observed the 5 tests we set up and run yesterday. Results were great and everything came out as expected with the largest inhibition area where 100% garlic juice was an applied and smaller inhibition site as the concentration was diluted more. We also took pictures using the electronic camera of all the samples. Also, I reinvigorated my desire to try to obtain antibiotics to experiment with, and have decided to try my uncle again. I plan to visit him this Friday and discuss the issue. So far I am unsuccessful @ obtaining any data that we can compare our experiment with. But I found some other useful material). I plan to go to various University libraries to search again for the data. We kept our experiment alive in the autoclave to see the effects of time.  Wednesday 2/4/98  After school I again checked our experiment to measure the inhibition areas. As expected all the inhibition areas had reduced their sizes. I believe it is due to the degeneration of the allicin, the component that supposedly is responsible for the antibacterial effects of garlic. It has been published that allicin will lose its ability "in a few hours." I also printed out 2 preliminary photos of the ones we took yesterday to verify that we have saved the pictures and to use in the discussion with my uncle. I also called Ms. Doyle to verify.  Thursday 2/5/98  Today we again measured the inhibition zone of the garlic and again it was slightly reduced. Elisa and I set up 6 new experiments (#6-10) and we took a "before picture" all the dishes are now growing in the autoclave. We took pictures of 1-5 again.  Friday 2/6/98  The inhibition zone of trials 1-5 is now unclear. The original hallows around the garlicked disks are still visible, but the bacteria is scattered and growing in start up colonies in those areas. We believe that the condensation from the respiration of the bacteria that gather on the lids and eventually fall back onto the dish help spread the bacteria even more. There is in many cases even bacteria growing under the disks with garlic on it. However, there is still a lit fewer colonies and smaller colonies on the former hallow than in the other areas. I also got a prescription for erythromycin today. This is an antibiotic that is presently used to control these bacteria. I also learned of the MIC today. Both of the previous resulted from a visit to my uncle's. The dishes 6-10 had expected results. Photos were taken of 6-10.  Tuesday 2/10/98  Yesterday I picked up the medicine I was prescribed @ Kaiser for $5. They came in 30 pink tablets with 400mg of medicine per tablet. Today we again checked out our results. In the dishes of test trials #1-5, the results were similar to what we saw last Friday. However, some of the specimens turned a tinge of yellow. (Usually they are milky white) (Maybe they have died?) The test trials #6-10 had hallows around the disks, however, there are small colonies of bacteria growing inside the hallow. Today we "played around with" our medicine in order to establish procedures for the test. The medicine was ground up into dust and distilled water was added to it. It was semi dissolvable. According to my research, the medicine is usually dissolved in an organic mixture, which we do not have. At any rate, w tried to establish the medicine in concentrations of 75%, 50%, 25%, and .2%. The .2% was also tested because according to my research, the in vitro testing is usually in concentrations of 2(g to .02(g per ml of solvent. The 75% solution did not turn out too well. When we made it the solution turned into a gel like substance. We tried to soak the disk in it but all we obtained mainly were chunks of medicine. The 50% solution also dried quickly, but we were able to soak the disks in before it dried. We tested all the solutions on one petri dish using the same procedures as usual. Today I also called some specialist in the pharmaceutical field. One call led to another until I reached Professor Jack Seaman, the head of the microbiology department @ SF state. After giving him my e-mail address and phone #, he said he would try to obtain some info on the inhibition of B. cereus. Hopefully, this will turn out well.  Wednesday 2/11/98  Today we observed our test trial from yesterday. For 25%, 50%, and 75%, the results were very similar. Perhaps he disks could not soak up the medicine in the allotted concentrations. The .2 % concentration yielded a 15-mm ZI. We then decided to use the concentrations of .05%, .1%, .15%, and .2% for our tests. This was because it was easier to have that amount of medicine dissolve in more water. Also, results were still present. We ran 10 test trials with the concentrations mentioned above, in the same manner as the garlic tests.  Thursday 2/12/98  Today we observed the antibiotic test results. We got pretty surprising results. The disks with .15% seemed to have an overall larger IZ than the .2%. Perhaps the disks could not absorb all the medicine from the .2 concentration. Or it could have been human error, or maybe the drug has a peak activity level with a certain [c]. Who knows?  Friday 2/13/98  We again observed our antibiotic tests. The inhibition zone has been inhibited by a yellowish bacterium. The white bacteria, what we usually see, as Bacillus cereus did not grow into the zone muck (1-3mm) but the yellowish stuff grew all over. Maybe we had contamination of another type of bacteria that is resistant to the antibiotic.  Friday 2/20/98  Today we observed all our specimens one last time. The antibiotic's dishes appearances did not change much from last time. I took pictures of selected specimens. I also observed the originals and saw that they did not change much. Then I turned up the heat to its maximum and left it for the weekend. This should kill the bacteria.  Monday 2/23/98  We observed the bacteria that should be dead. The smell was horrible - even worse than before - and it clung to your clothes for about 5 minutes. The dishes looked dried up and the bacteria on them took on an orangish hue. They looked like the yellow layer we saw before on the dishes except that they were a little bit darker in color. We decided to let the "cook" for another day.  Tuesday 2/24/98  Today my partner Elisa spilled bleach into the petri dishes to kill the bacteria completely. When the bleach was poured into the dishes, the entire gel became white. Then the bacteria began to foam. She swirled the bleach around and soon most of the gel was dissolved. After being set out for a while she put them into a bio-hazardous bag, double bagged it, sealed it, and clearly labeled it bio-hazardous, and our teacher disposed of it. The autoclave was left on high to kill any bacteria still "lurking" around.  Friday 2/27/98  Today we finished the last touches of the experiment. We massed out 100(L of garlic extract and found that it massed to about .145 grams. With that information we deducted that the density of garlic is ~ 1450 g/L or 1.45kg/l. We also billed the last remnants of our bacteria from. We are officially done with our experiment. |

[ABSTRACT](http://docs.google.com/abstract.html)

*This Web Site is Best viewed with 256 or more colors.*

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