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| **Does Nutrition Have a Significant Effect on How Our Immune System Functions?**  **A Research Project by Ashley Blake & Heath Cady**  Does nutrition effect how our immune system works? These are the questions we have tried to answer through a lot of research, as well as a survey about eating habits and immune system efficiency of Amador High School students. We started our topic, looking at nutrition in mice, and how it would affect them mentally and physically. Through conversations with Mr. Thiel and a lot of thought, we decided that it would probably be a bad idea to use mice as subjects. As we changed our topic by using humans as subjects, we began considering ways to incorporate nutrition into a study. Mr. Thiel suggested looking into its effects on the immune system. We decided that this would be a better and more realistic project to do. Since we were both interested in nutrition, probably because both of us are athletes, as well as Californians (who tend to be very health-conscious). I was very excited in the shift from mice to humans because I can benefit more from the information we collected through doing this research project. We decided the best way to find evidence supporting our hypothesis would be by creating a survey about the topics involved. Most of our research was focused on the immune system (what it is, how it works, components of it) and nutrition (vitamins and minerals that have a direct impact on how the immune system functions). THE IMMUNE SYSTEM What determines what makes us sick? The human body comes in contact with many foreign substances all the time. For example there are bacteria, fungi, viruses, and many other different chemicals. These factors often cause illness in the organism they infect, and sometimes even death. Yes we have drugs and medicines to fight off these invaders, but shouldn�t we have our own way off fighting off these diseases on our own? We do, and it lies in our *Immune System*.  The study of the Immune System is known as Immunology. (1) Anything that relates to fighting off disease in any part of the body all falls under Immunology. Say there is a white blood cell eating infectious bacteria, or a specific organ producing antibodies to kill foreign invasion, it�s all studied under immunology. It studies what the immune system is composed of and what their functions specifically are. Many different cells, organs, and chemicals produced by our bodies fully make up the immune system. (2) And their soul mission is to protect us from disease no matter what the cost is.  Since disease comes in many forms, the immune system has so many of its own ways of fighting them off. Viruses are often a huge problem to the immune system. We are exposed to viruses every day, which range from the common cold to HIV. Most of these diseases can be fought off by the production of antibodies. Antibodies are produced by what we call B-cells. The body contains millions upon millions of these B-cells, which make for many different types of antibodies. The B-cells will immediately detect a foreign invader. Once it does, it and many other cells will release antibodies that will easily lead to the destruction of that invader. This is also a good way of killing invading bacteria as well. But without T-cells, B-cells would often not function. T-cells are often called helper cells. T-cells detect foreign invasion to the body as well, but instead of making antibodies, they produce proteins. (3) These proteins send signals to the B-cells, telling them to make antibodies. Infections are also dealt with by means of T-cells, but these are called inflammatory T-cells. They only specialize in forms of infections and other forms of injury. The third, and last type of T-cells is Nonspecific Effector Cells. They are able to fight off invasion without help from other cells. Macrophages can move freely around the body to destroy invaders and neutrophils can eat infected cells. And another major helper T-cell in the body is the Natural Killer (NK) cell. These cells are also referred to as cytotoxic T-cells. (4) They are able to kill any harmful cells that have been infected by a virus or fast spreading cancerous cells without any outside assistance.  ([Intro1](http://docs.google.com/introduction.html))([Intro2](http://docs.google.com/intro2.html))([Intro3](http://docs.google.com/intro3.html))([Intro4](http://docs.google.com/intro4.html))  [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2002 Projects](http://docs.google.com/AP2002/index.html)][[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |