

# Agriculture... the Human Lifeline

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Do you know a child that was born after the year 2000? Is it a grandchild, a niece, or a nephew? Maybe the child is even one of your own. Would it surprise you to know that that certain child has a one in three chance of being diagnosed with some type of diabetes in his or her life time? We, as Americans, have an epidemic on our hands. 1.3 million people are diagnosed every year with diabetes. A bigger problem is that 5.9 million people have the disease but go undiagnosed. That is more than the population of Missouri or Tennessee! Why does this happen? How can we not realize something so dramatic is happening to our bodies? It could be because most of us lack information on basic health subjects, or it could simply be that we are wearing blinders, getting wrapped up with performing everyday tasks. It can be easy to become desensitized to the symptoms of the disease, especially if they occur gradually.

Now let me switch gears for a moment. As an agriculturist, I was guilty of the same type of tunnel vision. Until a few years ago if something didn't apply to what I did on the farm, then it was something I didn't need to know. Farming was all about raising cattle, growing wheat, and driving pickup trucks. Of course I knew it was a little more than that, but I did not really have the big picture. All that mattered to me was how to get \$1.30 per pound and 50 bushels to the acre.

You might be asking "How are these two issues related?". Well, let's go back to the beginning. Have you ever heard of Sir Frederick Banting, Dr. Charles Best, or the Englishman Islet of Langerhans? Neither had I, but they have impacted my life in a very important way. Let me explain. These men are responsible for a largely uncelebrated discovery linking livestock to human life and wellbeing. In fact, their Nobel Prize winning research has saved 500 million lives. It all began when Banting and Best,

guided and inspired by Langerhan's initial research on diabetes, set out to find a way to treat and control the disease. The doctors went to work experimenting on dogs, isolating the Islet cells in their pancreases by tying and constricting the distributive passage ways for the organs' product, and thus raised the dogs' blood sugars and induced the condition that is known as Type 1 Diabetes. Banting, who grew up on a farm, then collected cells from a fetal calf pancreas and injected them into the now diabetic dogs. The experiment caused a dramatic fall in the blood sugar of the dogs. The product of the pancreas, insulin, was finally discovered and recognized as the means to control diabetes.

What soon followed in their research was the use of swine in harvesting porcine insulin. Millions of people who had been dying of Type 1 Diabetes now had an anti-diabetic serum that would not cure their disease, but save their lives. Even with today's technology and the use of synthetic insulin, animal insulin is still critical to people who benefit only from animal insulin. That brings us to the present day. What about the future? I bet you are thinking about stem cells, right?

Well, stem cell research could very well be the best strategy to employ to find the perfect cure. It is believed that stem cells could be used to grow insulin-producing Islet cells, identical to what would be found in a healthy pancreas. But with the controversy surrounding this scientific undertaking, efforts to affectively study this possible new cure have been inhibited. It will likely be many years before any beneficial information or procedures come from stem cell research. In the mean time are diabetics expected to simply wait for all of the opposition to subside? Of course they aren't. There is an alternative procedure to cure diabetes that is more within sight than stem cell cures and it looks to be just as promising. The answer is transplantation of Islet cells. Scientists are

coming close to successfully curing diabetics by giving them transplantations of the insulin-producing Islet cells. However, when this does become a viable option, there will not be enough human donors to supply all of the Islet cells necessary to cure the millions of Type 1 diabetics. That is where agriculture research comes into the picture once again. Animal Islet cells could be used in place of human Islet cells. Animal to human transplants, however, usually fail because many animals contain a sugar molecule called “alpha Gal”, which humans do not have, and it is, therefore, easily recognized as foreign and readily destroyed by the immune system. In response to this obstacle, researchers at the University of Missouri have successfully bred the gene codes for the making of alpha Gal out of a number of pigs. The promising potential of a supply of swine genetically suited for Islet cell transplantation is drawing the attention of many diabetics.

Here is what it is like to have the most chronic type of diabetes. Type 1 elevates the blood sugar because the pancreas stops producing insulin, which allows the body to utilize glucose. Without treatment, a person may experience an increased appetite, cravings for unusually large amounts of liquids, and extreme fatigue. Since the body cannot use sugar in the bloodstream, it will burn stored fat in the body. The burning of the fat leaves behind a toxic residue. In severe cases, enough of this residue builds up to poison the body, a process known as ketoacidosis. At the same time the body tries to rid the abnormal amount of abrasive sugar from itself by continuously flushing it out of its system with urine. This can quickly dehydrate the body. Within two to three weeks, irreparable damage has been inflicted on the heart, eyes, kidneys, and blood vessels and can cause severe weight loss, amputations, blindness, and even early death.

I know because four years ago at the ripe old age of fourteen, I almost lost my life to diabetes. Without Dr. Banting's knowledge of agriculture from growing up on a farm, I would be a statistic. I am sure we all know someone who would be. Instead, my life has been impacted in a very personal way by agriculture, and today, because of those three men's contributions, I carry in my pocket a vial of insulin I rely on as my lifeline. Now, because of transplantation research I am given new hope of something more than a temporary treatment: the ultimate cure for my disease. I never would have imagined that a pig and a calf could have such an effect on my life. And to think, this all came from agriculture.

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I hereby certify that I meet all the eligibility requirements for participation in the state FFA public speaking event for the current year as set forth by the State Executive Committee and State Staff.

My speech entitled Agriculture... the Human Lifeline  
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It is understood that I am encouraged to utilize all available training facilities of my local school in developing my speaking abilities and that I may obtain facts and working data from any source. However, when information from other sources is used, such as direct quotes or phrases, specific dates, figures, or other materials, it must be marked in "quotes" in the manuscript and identified in the bibliography at the end of the manuscript. Failure to do so represents plagiarism and will automatically lead to my disqualification.

3/29/2005

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