Pesticides In Potatoes And Other Products

Have you ever heard the saying “you are what you eat?” According to the US National Library of Medicine National Institutes of Health, “Over 1 billion pounds of pesticides are used in the United States each year and approximately 5. 6 billion pounds are used worldwide”. This correlates to over 3 pounds of pesticides used annually for every citizen of America. So why is pesticide use such a big deal? According to the Pesticide Action Network UK, “Long term pesticide exposure has been linked to the development of Parkinson’s disease; asthma; depression and anxiety; cancer, including leukemia and non-Hodgkin lymphoma; and attention deficit and hyperactivity disorder. ” Since pesticides are used to stunt the growth of produce and other food items, this experiment will test whether or not the method used for washing produce treated with pesticides, in this case conventional potatoes, affects their ability to grow. This will show if pesticide residue can be removed, allowing greater growth of the potato, or if its effects are permanent. The findings of this data will be beneficial to consumers so they know what is best for them and their families.

“Pesticides are defined as chemical substances used to prevent, destroy, repel or mitigate any pest ranging from insects, rodents, and weeds to microorganisms”. The USDA found 35 pesticide residues on products, 6 of which are probable carcinogens. A carcinogen is a substance or exposure that could lead to cancer. This means that using pesticides, which are found on everyday items, is increasing the risk of developing cancer. The earliest use of pesticides dates back nearly 4, 500 years ago. In the beginning, “pesticides” used were all natural sources, mainly derived from other plant or animal products. “As there was no chemical industry, any product used had to be either of plant or animal derivation or, if of mineral nature, easily obtainable or available”. Even until the 1940s, mostly natural substances were still the main ingredients of pesticides. It wasn’t until later in the 40s that synthetic pesticides were discovered. At this time, people were not concerned about the health effects or other related issues. “Food was cheaper because of the new chemical formulations and with the new pesticides there were no documented cases of people dying or being seriously hurt by their "normal" use”.

Today, pesticides can be found on almost all conventional food sources. Recent studies show “washing produce with running water reduced the amount of pesticide residue for 9 of the 12 tested pesticides”. Full strength 5% vinegar was found to be equally as effective while a 10% salt solution was found to be the most effective. A 10% salt water solution is created using one-part salt to nine-parts water. This experiment will test which of these methods will most effectively decrease the amount of pesticide residue on a conventional potato. All potatoes have “eyes” which are “dark dimples on the potatoes skin clustered near the front of the potato”. Out

of each of these eyes, the potato begins to grow sprouts. If planted in soil, the sprouts growing out of the eyes of the potato will create roots that attach to the ground. A new potato begins to grow using the starch from the original potato.

Potatoes are treated with fungicides before growing season, they get sprayed with herbicides before harvesting, and then they are sprayed again after they are dug up to prevent sprouting from occurring. Chlorpropham is the most common pesticide to prevent sprouting found on conventional potatoes with 80. 2% being infected. Chlorpropham has been found to affect the respiratory tract, the urinary system and the body's digestive profile. "This chemical may also impact the liver, the eyes, and the skin". Since this pesticide has been found harmful to human health, this experiment will determine whether its residue can be reduced. Once the potatoes are washed using water, vinegar, or salt water, they will be left to grow. After a period of time, the number of sprouts will be counted from each group and compared to each other. If certain groups have more sprouts after the allotted time period, it will indicate that pesticide residue on potatoes, and possibly other produce, can be reduced using that method of washing; therefore, decreasing the harmful effects to consumers. These findings will benefit the overall health of consumers by informing them of the best method to remove pesticide residue prior to the consumption of conventional potatoes.

Billions of pounds of pesticides are used every year on conventional potatoes and other produce. This experiment will determine whether using a specific method of washing can reduce the amount of pesticide residue on conventional potatoes, or if the effects are permanent. Based on the research collected, it is hypothesized that if potatoes are washed using water, 5% white vinegar, or 10% salt water, then the salt water will remove the greatest amount of pesticide residue, resulting in the most sprouting. The data collected from the washed potatoes will be compared to the control group, the potatoes that were not washed. The method of washing could also have no effect on the sprouting of the potatoes.