Abstract

A major concern in Alaska is the presence of Paralytic Shellfish Poisoning (PSP), which impacts the commercial and subsistence seafood industries. This has a significant impact on the Alaskan economy and subsistence. The economy and development of a lateral flow test has been studied to create a quick and easy test to determine whether sea food is safe to consume. Previous research has shown that lateral flow tests are a simple, quick and easy test for determining if seafood has been contaminated with PSP.

The goal of this research was to create a portable lateral flow test to detect the presence of PSP in seafood. This test could be used by the public to detect whether seafood has been contaminated with PSP, which would prevent PSP poisoning.

Methods and Results

1. Overall Dimensions: 1.0cm x 3.0cm
2. Overall Dimensions: 1.5cm x 10cm
3. Overall Dimensions: 3.0cm x 10cm

Methods/Description

1. Protocol #1
   - Phosphate buffered saline (PBS) was used to wash the membrane
   - 200 µl of primary goat anti-chicken antibodies was added to each well
   - Slowly added 200 µl of Cy3 conjugate to each well
   - Incubated for 15 minutes
   - Washed 3 times with PBS
   - Developed with ECL substrate
   - Results: No reaction

2. Protocol #2
   - 15 µl of 50X primary rabbit anti-chicken antibodies in the center of the nitrocellulose membrane
   - Slowly added 2 µl of 50X goat anti-rabbit antibodies
   - Incubated for 15 minutes
   - Washed 3 times with PBS
   - Developed with ECL substrate
   - Results: No reaction

3. Protocol #3
   - 15 µl of 50X primary rabbit anti-chicken antibodies in the center of the nitrocellulose membrane
   - Slowly added 2 µl of 50X goat anti-rabbit antibodies
   - Incubated for 15 minutes
   - Washed 3 times with PBS
   - Developed with ECL substrate
   - Results: Positive reaction

Discussion

In conclusion, the experiment was performed and displayed in the different designs. The first method displayed positive and the second method displayed a positive reaction. The third method displayed a positive reaction. Overall, the third method was the most successful, as it addressed all previous issues in the lateral flow test to detect the presence of PSP in seafood.

Although the majority of our designs were problematic, we were able to demonstrate a progression of improvement in the method and development of the test. Through our experiments, we were able to learn that testing the nitrocellulose paper in PBS does not improve the visualization of antibody interactions.

In the future, we will be working on antibody interactions during methods 1 and 2, as we found that our antibodies have expired. However, after performing a functional test, we found that our antibodies were not used and therefore we used our model that is modeled adjusting. This is not the condition that is only possible in the third design (method 1) due to the lack of the ECL substrate. Overall, our lateral flow paper was used in this model, and proved to be absent.

We are currently working on using the actual antibodies, however due to our limited resources, we are not able to pursue the project further. In the future, we intent continue the project in order for pursuing the design for a dipstick to detect PSP.

The next challenge and phase of this experiment is to use a lateral flow test that is more specific to detect PSP. This would involve the use of control antibodies and their interactions. This will be conducted to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction. This method will be used to display a more specific reaction.