To be or not to be, that's water thing

1st YONG WILLIAM, 2nd KONG CHI KEI, 3rd TAM I MAN, 4th HUANG TENG WA, 5thPAO HOI KIN

Abstract

Some people keep animals at home to make fun to their lives. Many people choose to keep fish because they are smaller in size and only move in the tank, making it easier to control their space. Moreover, breeders believe that raising fish is relatively simple, only need to feed and change the water regularly. In fact, fish farming is not easy. People don't know that fish farming is skillful. Fish live in a different environment than cats and dogs. Fish are aquatic animals. Breeders need to monitor the water quality with specific equipment to know whether their living environment is suitable. On the other hand, the fish are smaller and it is difficult for us to notice if they are sick. In people's busy life, it is inevitable to forget to monitor the water quality of fish tank, so the manufacture of automatic fish tank water quality monitor is very important.

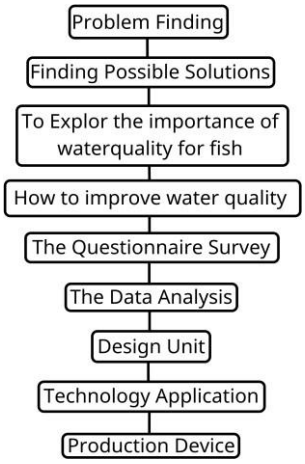
Keyowrds: water quality; die; ammonia; nitrifying

1. Introduction

Fish farming may seem easy, but if you don't know the water quality in the fish tank, such as water temperature, pH, ammonia content, etc., it will affect the safety of the fish. Since these factors directly affect the safety of fish, we hope to find effective ways to make it easy for breeders to find some methods to ensure that fish can live a healthy life. Since fish are aquatic animals, unless specific equipment is used to monitor the water quality regularly, fish farmers cannot know whether the living environment of fish is safe enough. At the same time, because of their small size, most of the symptoms of fish are difficult to notice. If the fish get sick due to water quality problems, it is difficult for fish farmers to find out in time and make countermeasures to develop regrets. In addition to our hope to create a fully automatic monitoring device, we also hope that through this device, everyone can realize the close relationship between water quality and fish survival, and inspire people to pay attention to the marine environment and ecological

protection issues.

2.Method and Experimental Details



In a normal fish tank, the content in the water is almost zero. Nitrite is also toxic to fish. The nitrite content in seawater should be zero, but the nitrate content is too high, but it is actually a non-toxic leak. The pH value is between 6 and 9. There are some special fish that are difficult to raise, such as angelfish, which are suitable for living in a pH value between 5.8 and 6.8**.**

This work used arduino to design a device to remind the public to pay attention to the water quality of the fish tank, using a turbidity sensor, a device that automatically adds nitrified bacteria and a warning signal light, it is hoped that timely improvement of water quality and reminder of feeding owners to change water and clean up the manure can be achieved.

3.Result and Discussion

According to the data we had collected in the questionnaire.

The data shows that most of the people do not have a deep understanding of how to keep the fish's health, but in fact there are almost 70% of people have the experience of keeping fishes as a pet. So, in our project, we aim to let more people keep there fishes healthy in a more easier way and make a machine to automatically keep the environment suitable for fishes to live.

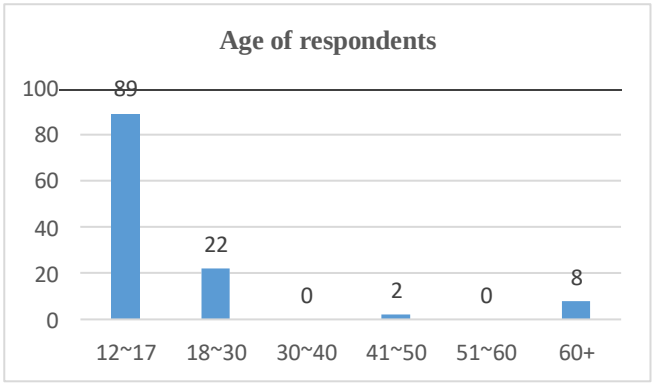


Figure 1

Figure 1 shows that the total number of respondents in this survey was 121, most of whom are under the age of 12~17, accounting for 89 respondents.

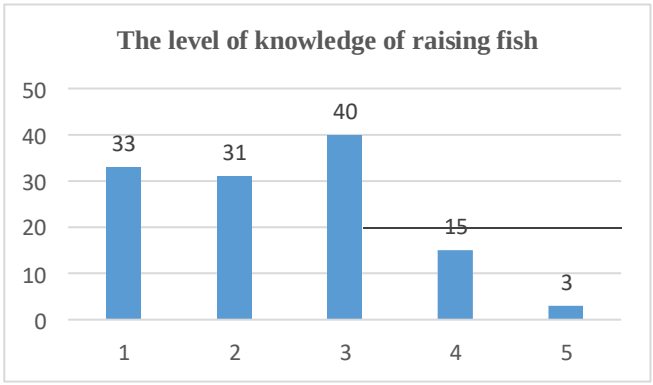


Figure 2

(1 is completely ununderstood; 5 is fully understood.)

Figure 2 shows that most of the respondents actually know a moderate level of knowledge about raising fish, while only a small percentage fully understand how to raising fish.

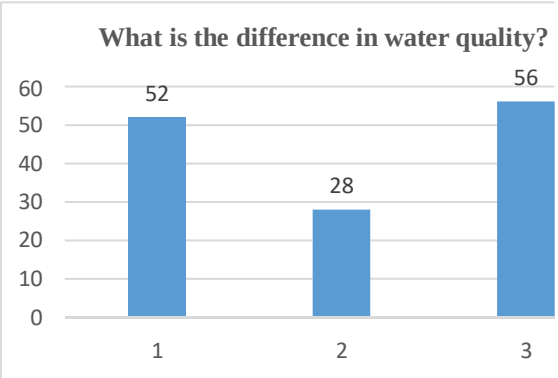


Figure 3

1.Can be seen with the eyes

2.When the fish start to get sick

3.When the turbidity detector detects that the water quality is starting to deteriorate (the wat er becomes turbid)

Figure 3 shows that 56 people believe that when the detector detected turbidity, it proved that the water quality was deteriorated. And 52 people think that with their eyes you can judge how clean the water is. Another 28 believe that when fish are found to be sick, it proves that the water is no longer suitable for fish to survive.

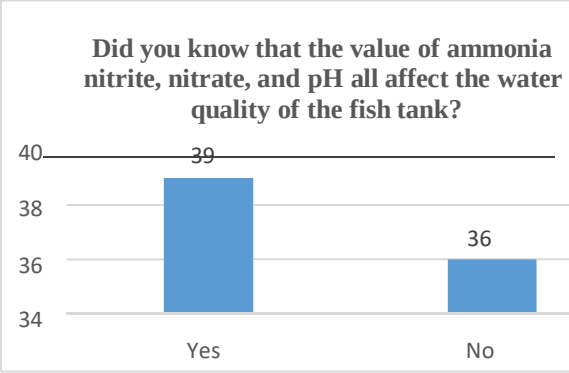


Figure4

Figure 4 shows that there were 3 more respondents who knew that the values of ammonia, nitrite, nitrate, and PH would affect the water quality of the fish tank than those who did not know. There are 39 people who know and 36 people who don't know.

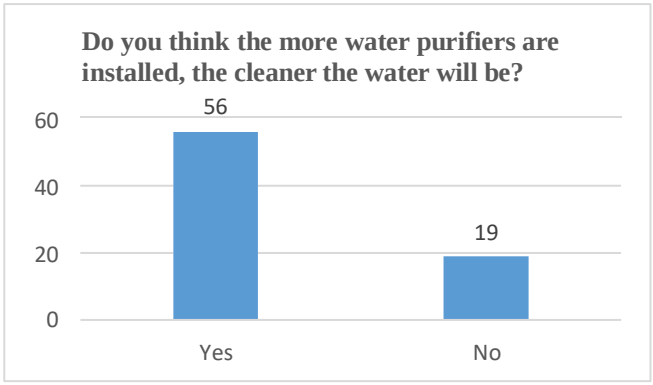


Figure 5

Figure 5 shows that there were 56 respondents who thought that the more water purifiers were installed, the better the water quality would be, and 19 people who thought they would not.

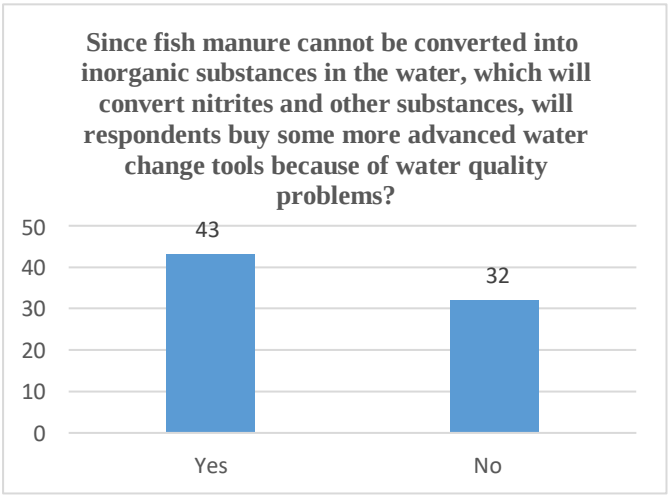


Figure 6

Figure 6 shows that 43 people will buy some more advanced water changing tools because of water quality problems, and 32 people choose not to.

4.Conclusion

In our project, we first did some research of the public's understanding of how to keep fishes as a pet. And we found out that most of them do not really know about the true way or keeping the fish healthy, so we had designed a machine to automatically control the environment of the

fish tank. When the concentration of the ammonia or other un-healthy molecules are over the healthy standard, our system will put out so chemical to make the environment better.

5. Acknowledgements

Major thanks:

Dennis Ku Seng Wai and Mavis Chang Iok Kam who gave us the golden opportunity to work on this project, which also helped us in doing the research and we have learnt so many new things during the process. Secondly, we would also like to show gratitude towards our teammates who gave us lots of support and had helped us a lot in finalizing this project.

6. References

[1] https://www.burkert.com.cn/cn/type/MS09

[2]https://patents.google.com/patent/CN103234959A/zh

[3] http://www.labptp.com/knowledge/show-122.html

[4]https://zh.m.wikipedia.org/zh-hant/%E5%85%89%E9%9B%A2%E5%AD%90%E5%8C%96%E6%AA%A2%E6%B8%AC%E5%84%80

[5] http://news.boqii.com/fish/34257.html

[6]http://66how.com/gsy040/

[7]https://zhuanlan.zhihu.com/p/59010282

Other details:

The automatic dosing device in the device is equipped with nitrified bacteria, when the turbidity detector immersed in the fish tank monitors the water quality due to factors such as ammonia making the water quality very turbid, it will trigger the motor of the dosing device, release the nitrified bacteria liquid and light up the warning light.