Nameer Al-Rawi

I want to introduce my self

- I am a budgie breeder for many years. Through this beautiful hobby, I met wonderful people and gained experience from them, and I still do to this day.
- My university studies are Biology Sciences (Microbiology). I currently work as a Quality Control Department Manager in a Chemical Analysis Laboratory….
- I am a member of the Jordanian Ornamental Birds Association. (JOA 010)

Introduction

- From my work in the chemical laboratories since 2009 and my interest in raising budgerigars, I found that the specifications of drinking water for humans is within the international standard specifications, so that people can fully benefit from the water, as it provides nutrients. It also does not cause harm if it meets the specifications.
- Here I thought at the same time about the type of water for birds and the answer was that it is almost similar to the specifications of human drinking water. This is because they drink from rivers, which are fresh water. I am talking of course about birds in the wild, and it is necessary to provide these water specifications to birds in captivity or with bird breeders.

Why use acidification for drinking water for birds??

One of the most important Chemical specifications for water that the breeder must pay attention to is:

1. **The hydrogen ion concentration (pH):**
   The hydrogen ion concentration expresses the degree of basicity or acidity of water. The hydrogen ion concentration must be (7.0).

2. **TDS (Total Dissolved Solids):**
   The water should be free of dissolved salts such as table salt.

3. **Turbidity:**
   The water must be pure and free of suspended and dissolved impurities.

4. **toxic mineral elements:**

   Toxic mineral elements, when their concentration exceeds the safe limit, lead to poisoning of the bird when it consumes water containing them such as iron.

5. **Nitrates & Nitrite**

   The water should be free of nitrates and nitrites, because their presence in high levels is toxic.

6. **Hardness**

   Hard water containing high levels of magnesium and calcium salts should be avoided.

7. **The water must be free of pathogenic bacteria, especially salmonella bacteria.**

- Here I will talk about the most important point, which is that when filling the water for the birds, I may not change the Bird Drinker Feeder for more than two days... and when changing the water I see a semi-viscous transparent substance on the walls of the drinking feeder
- Here comes the question???? (Why when the water is changed daily, we don't see this sticky substance but only some food residue?)
  After some time and searching for the reason, I found that the reason for the appearance of this sticky substance is the growth of microorganisms. These are organisms that cause diseases for most birds if the water is left unchanged and the drinker feeder isn't cleaned.
- The factors that help microorganisms grow are: -
  A. **The right temperature**
  B. **food residue in water**
  C. **pH of water more than 7.0**

- Most professional budgie breeders should change the drinking water and clean the drinker feeder once a day to prevent health problems for the birds, as drinking water is the most important cause of the spread of diseases by
  1. Mostly after eating the grains, the birds drink water and some food remains may fall into the water. Here, the breeder does not notice this and the water remains for more than a day, which causes the formation and spread of bacteria and fungi.
  2. Sometimes some bird droppings may fall into Drinker Feeder and this can be a source of diseases such as worms or bacteria.
- Through my reading of some research on raising poultry farms to produce meat and eggs, I found that one of the most important ways to control diseases is to acidify drinking water... I have tried it with budgies for three years and I am still satisfied to this day. As I had the necessary means to conduct research, as birds were available and I had a laboratory ready to conduct the experiment.

- Bird Drinker Feeder must be cleaned regularly.

pH of water

- In order to further understand acids and their useful behavior in water, we first need to have a good understanding of pH and what it means. To keep the definition of pH in simplest terms, it is a measurement of the concentration of hydrogen ions [H+] in an aqueous solution (for the purposes of this article, we will be referring to water).
- The pH scale is generally presented with values that range from 0 to 14. Pure water has a pH value of 7, and any solution with a pH less than 7 (pH 7 to zero) is regarded as “acidic” and any solution with a pH greater than 7 (7 to 14) is regarded as alkaline, or “basic.” The pH scale is a logarithmic; on this scale, each whole number change results in a solution that is 10 times more acidic or basic.

  Examples:

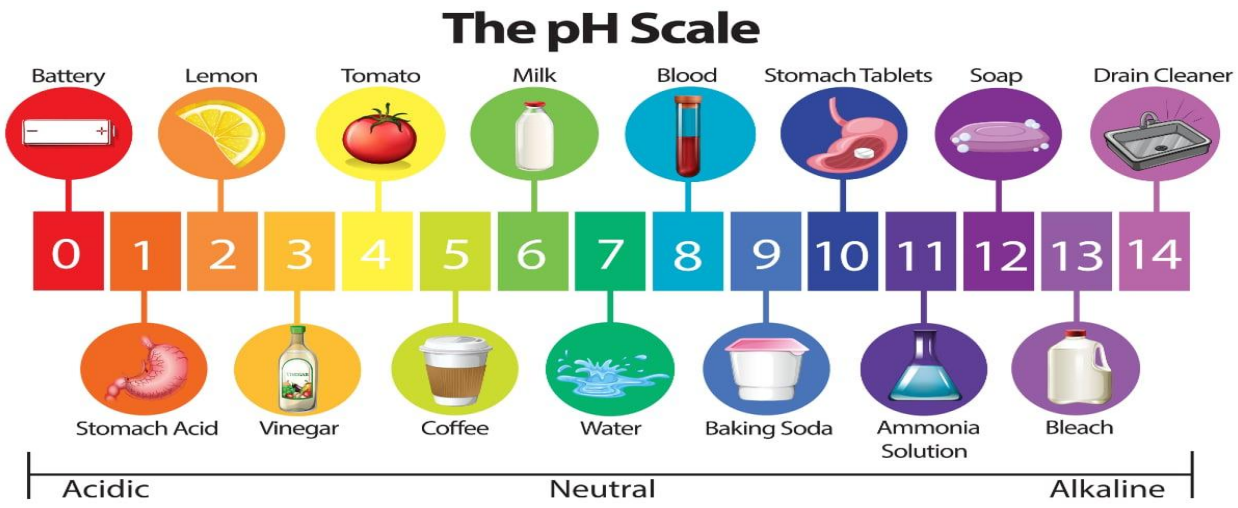
  A pH value of 3 is 10 times more acidic than a pH value of 4, and a pH = 3 is 100 times (10 times 10) more acidic than a pH = 5.

  The same relationship holds true with alkaline solutions:

  A pH value of 11 is 10 times more alkaline than a pH value of 10, and a pH value of 11 is 100 times (10 times 10) more alkaline than a pH value of 8.

  When acidifying water, the goal is to increase the concentration of hydrogen ions [H+] to create an excess of them in the water. This shifts the equilibrium of the water, resulting in a decrease in, or lowering of, the pH of the water.

  The ideal pH level for Bird water is between (6.0 to 6.8) as this range provides optimal conditions for nutrient absorption and microbial control in the digestive tract.....



The importance of acidifying drinking water

1. Acidification prevents bacteria from multiplying.

The acid reduces the pH in a bird's crop, making the gut less hospitable to bacteria. This, in turn, reduced the amount of contamination at the processing. Most pathogenic bacteria are Gram-negative and are therefore sensitive to acidic environments, which have a bacteriostatic effect. When birds drink twice as much as they eat, the acids in the drinking water can have a beneficial effect on the crop, reducing the development of pathogens. That must suppress bacteria that are “pH sensitive” like E. coli, Salmonella& Listeria.

2. Acidification does not affect feed probiotics

Many probiotics are rapidly gaining popularity in bird production. They are either lactobacilli, lactic acid producing bacteria, or protobacteria, which are less sensitive to acidic environments. As a result, acidification of drinking water has no effect on the probiotic products in the feed

3. Acidification can aid early protein

The acidifiers improve nutrient digestibility. (Protein, Ca & P in young birds). It improves digestive enzyme activity and litter quality.

4. Water acidification prevents the growth of harmful fungi and yeasts in birds

One of the most important bird diseases is harmful fungi and yeasts, which are caused by poor hygiene and high humidity in the feed, which leads to the growth of mold that infects birds and causes many deaths in young bird

How to acidify water for birds

There are some points that must be taken into consideration before working on acidifying water: -

1. You must purchase a simple device (pH meter) to measure the acidity of the water, along with the calibration solutions. This device does not cost more than $20

2. The water provided to the birds must be tested by a device (pH meter) before acidification to ensure that need or not
3. We may need some precise tools such as
    a. Small electronic scale

    b. Graduated dropper

    c. Teaspoon (Spatula)

d. Choosing the type of acid added to the water, which are several types:

Acids generally are categorized as strong or weak. Only weak acids should be used for bird's water. And, weak acids can be either organic or inorganic There are a variety of weak organic acids on the market. They include:

1. Acetic acid or cooking vinegar

It is one of the weak organic acids available in all stores, but you must be careful as it is available in natural and artificial forms. Natural forms are preferred because they contain beneficial bacteria

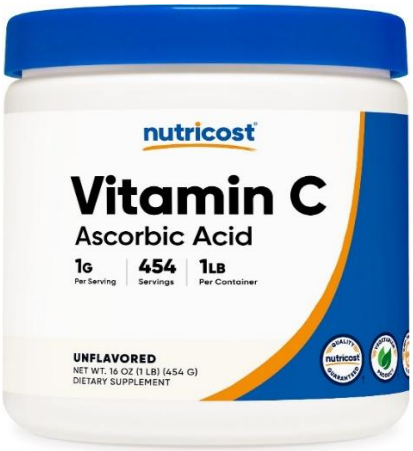
2. Citric acid

It comes in two forms: -

1. Liquid as is natural lemon
2. In the form of solid salt

3. Ascorbic acid (vitamin C)

1. Available in bird food supplement stores. Pay attention to the concentrations when purchasing
2. It is a potent natural antioxidant, which mitigates the adverse effects of stress and improves productive performance.
3. Studies have established the positive effects of dietary AA on improving immune response, growth performance and health status in birds under stressful conditions
4. In addition to the previous benefits, it helps acidify drinking water



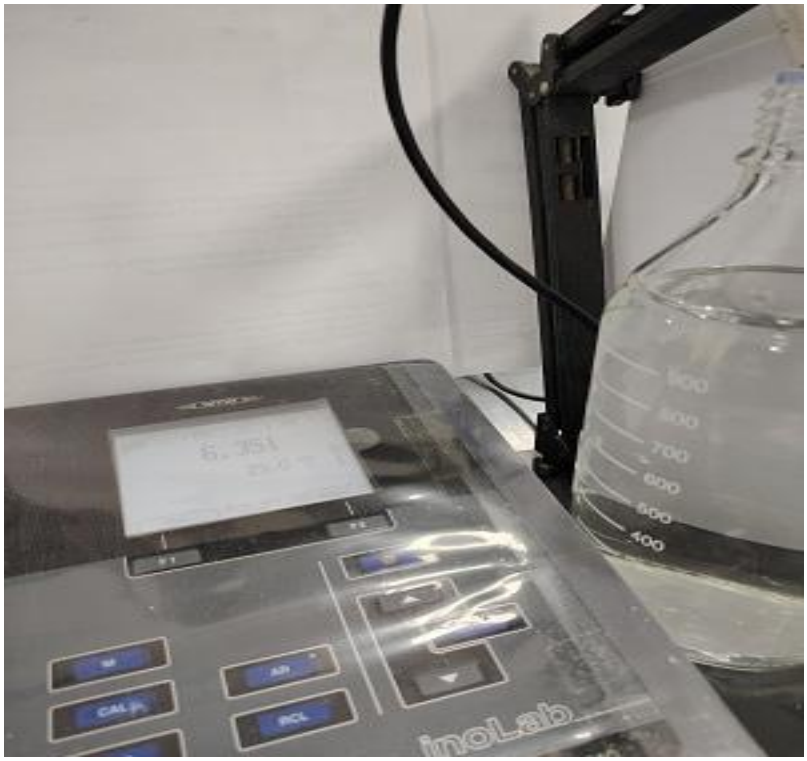
How to acidify water

1. Water must be tested (pH) before adding any acid. This is to know the type of water and how much acid needs to be added. For example, my main water source has a pH of (7.53)

2. Now we add the acid. I used citric acid powder.

3. A very small amount is used because the concentration of the powder is high... See the amount used to convert the pH from (7.53) To (6.35) for one liter of water.

4. After adding the acid, we must test the water using the (pH meter) until we reach the required pH (6.8-6.0). Here we see the transformation of the reading from pH 7.5 to 6.3 It is very suitable for birds. You can give it to birds.



Notes

1. You can use fresh natural lemon juice instead of **citric acid powder.** Use drops to determine the required volume.
2. If you cannot buy a device to measure pH **meter**, there is a method for testing that we used in schools, which is pH papers. But it is not as accurate as the device.

3. Water that is too acidic or alkaline can have negative effects on bird: -
   A. **Acidic water** with a pH level below 6.0 can also irritate and damage the digestive system of birds, reducing nutrient absorption and increasing the risk of disease.
   B. **Alkaline water** with a pH level above 8.0 can reduce the solubility of minerals and nutrients in the water, making them less available for bird absorption. It can also promote the growth of harmful microorganisms, such as bacteria and algae in the water, increasing the risk of disease transmission.

4. Caution should be exercised when some medications, supplements or vitamins are given to the bird, as they may be acidic in nature. Here, the pH must be measured after addition.

I hope this research will be useful to ornamental bird breeders to get rid of the problems caused by some diseases such as salmonella and fungi.

Acknowledgement

This article is supplied by the ***World Budgerigar Organisation (www.world-budgerigar.org)***, as part of their encouraged exchange of research information, and supplied to the WBO with kind permission by Nameer Al-Rawi