

## Testing the effectiveness of using Bio-Fresh and Bio-Booster together

I have been running some experiments on my Bio-Fresh and Bio-Booster products. I measured out nine ounces of distilled water, in a measuring cup, and stirred three grams of Bio-Fresh into the nine ounces of distilled water. I then poured out three ounces of the Bio-Fresh water, into a glass container and set that container aside.

This left six ounces of the Bio-Fresh water in the measuring cup. To this I added four grams of Bio-Booster and poured the contents into two glass containers, each holding 3 ounces of distilled water + one gram of Bio-Fresh + two grams of Bio-Booster.

So, I ended up with one glass container holding three ounces of distilled water + one gram of Bio-Fresh and two glass containers, each holding three ounces of distilled water + one gram of Bio-Fresh + two grams of Bio-Booster.

I then placed these three glass containers and their contents into a warming chamber where I could control the heat and humidity for about 20 hours. The results turned out to be within the parameters of what I have been reporting to my customers for several years.

The glass container holding only the distilled water + the Bio-Fresh probiotic, had visible cultures of friendly bacteria growing along the bottom of the container.

The two glass containers, each holding three ounces of distilled water + one gram of Bio-Fresh probiotic + two grams of Bio-Booster, had about four times as much culture growth, then the container holding only the distilled water + one gram of Bio-Fresh.

The reason I did this was to demonstrate for myself whether Bio-Booster has a positive effect on viable friendly bacteria cultures. By visual comparison, it appears as though the Bio-Booster gives a four fold growth effect to the 12 strains of friendly bacteria which makes up the Bio-Fresh probiotic product.

Interestingly, one of my customers runs a lab at a hospital and as part of his responsibilities, he grows lab cultures from patient samples, to identify pathogenic infections. Using his lab experience, he ordered several of the most popular racing pigeon probiotic products offered by the pigeon supply houses, or direct from the manufacturer. He also ordered Bio-Fresh from me and it turns out that Bio-Fresh was the only racing pigeon probiotic product that he could get to culture and grow in the lab.

This is no mean feat to accomplish, because I have selected 12 different strains of friendly bacteria, based on my understanding of the pigeon digestive tract. You see, some friendly bacteria strains grow best in a low pH environment (5.0 – 5.4), some friendly bacteria strains prefer a more neutral pH environment (5.5 – 6.5) and other friendly bacteria strains do their best work in a neutral to slightly alkaline pH environment (6.6 – 7.8).

Some bacteria grows only in the upper digestive tract, some prefer the middle area of the digestive tract and some grow only in the lower digestive tract. Some friendly bacteria prefer a certain kind of nutrient growth medium (prebiotic) and some prefer a different kind of nutrient growth medium (prebiotic).

When you mix all of these variables, none of the 12 probiotic strains will obtain ultimate growth conditions, in the lab situation, as they all have different needs. However, when the 12 different strains of friendly bacteria are introduced into the bird's digestive tract and finally reach their own preferred location, environment, and pH level with the correct nutrient growth medium supplied, they experience exponential growth.

Even under the circumstances of my test, the Bio-Booster product seems to produce about four times the amount of probiotic culture growth, when added to the Bio-Fresh product.

So why do many of the racing pigeon probiotic products have such a hard time growing in a culture dish?

Partially, it has to do with their shelf life and how they are stored. In order to increase their shelf life, the manufacturer is forced to include some kind of preservative. Unfortunately, these preservatives are not advantageous for lab culture growth, but they are good at extending shelf life.

Now, I am not saying that there is not a probiotic effect, when you use these other products on your birds. I am only repeating what the lab director reported to me about his findings. It is quite possible that these other probiotic products, are able to grow once they are inside of our birds. It is just that, under normal lab procedures for growing bacteria cultures, this lab director was not able to produce culture growth from the other probiotic products that he tested.

So, why does Bio-Fresh culture bacterial growth under these lab conditions when other products fail? Bio-Fresh is freeze dried and stored in our freezer. I only take out small amounts of the Bio-Fresh product, enough to fill several weeks of orders, at any one time. I give detailed instructions to my customers on how to store the Bio-Fresh product, and I give hints on how to get the most benefit from every dose. Also, I do not use preservatives.

It is very difficult to culture 12 strains of friendly bacteria, all at the same time and in the same media. There is a great deal of cross talk that goes on when you do this. You see, each strain of friendly bacteria, has as its primary directive, “survival”. Each strain has its own byproducts that are often somewhat inhibitive to competitors. It is like moving into a new neighborhood. Everyone looks out for everyone else, but everyone is also maintaining their own yards and protecting their own property from encroachment by their neighbors.

The saying is, “Good fences, make good neighbors”. That is how it is with growing 12 friendly bacteria strains together in the same medium, at the same time. Each friendly bacteria strain, practices competitive exclusion strategies to limit the ability of their neighbors (other probiotic strains) to grow into their own colony space.

The end result of this is, you initially get less colony forming units, when you are growing 12 strains, than you would growing just one or a few strains, but the collective benefit to the host is: superior overall health, improved immune response, better assimilation of nutrients, and superior resistance to pathogenic bacterial infections, when compared to what the host would receive if you were introducing a more limited selection of probiotic strains. And, make no mistake, I have researched many scientific papers to identify the particular strains of friendly bacteria that will give the greatest natural protection to our birds.

It is much easier to grow one probiotic strain than many, and if quantity was my goal, then I would select one lactobacillus strain of friendly bacteria for my probiotic product. However, I have read many studies on the issue and have come to realize that the functional benefits these 12 strains activate in the host, far exceeds the numerically derived benefit of sheer numbers.

Studies have shown that when there are multiple probiotic strains present, they protect each other from environmental stresses. Studies show that multi-strain blends of friendly bacteria, have a higher survival rate when passing through the highly acidic proventriculus and gizzard (where the pH is 2.5 – 3.5), than do a single strain or a few strains, when passing through these highly acidic areas of the digestive tract.

Passing through the proventriculus and gizzard is the biggest challenge probiotic bacteria face, because the extreme acidity in those chambers, tends to kill the friendly bacteria in transit. For some reason, multi-strain blends are better at surviving these conditions. I can only speculate that the unique secretions of each of these bacteria strains in response to the high acidity of the proventriculus and gizzard, has a collective effect that is greater than the sum of their parts.

There is one other consideration when deciding to offer a 12 strain blend or a 1 – 4 strain blend, and that consideration is; after the friendly bacteria are introduced to the birds, they will all settle in different areas and environments along the digestive tract, environments that offer those bacteria the best opportunity for survival and growth.

So, any inhibitory effect present from co-cultivating all 12 strains together, quickly disappears as the strains separate and migrate to the areas of the digestive tract that offers them the most advantageous growth conditions. This means that any downside is temporary, and once overcome, the full benefit of having all 12 probiotic strains begins to positively affect the health of the host (our birds).

But don't be fooled, just because someone offers a product with multiple strains does not mean you are necessarily purchasing a superior product. Just recently, I read a study that showed that when a certain popular friendly bacteria was used in conjunction with two other friendly bacteria strains, that it exhibited a strong inhibitory effect on these other strains. So, even when dealing with "friendly" bacteria, not all combinations are helpful and some are contrary to the effect you are trying to produce.

I do quite a bit of reading on the subject and make sure (as far as it is possible) to not only select strains that have a positive effect on the host, but I also look to see if these selected strains "play" well together. There are studies that show, that certain probiotic combinations actually increase the colony forming capacity of the group. This is one important aspect that goes into my selection process of the strains I will put into my probiotic blend. I am always looking to maximize the benefits my customers will receive from using my product.

Antibiotic resistance is becoming a major problem world wide and many pigeon fanciers are confronted with the fact that fewer and fewer antibiotics seem to have a therapeutic effect on the pathogens we confront in our lofts, throughout the year.

One recent study found that pathogenic bacteria can be made more susceptible to antibiotic treatments by modifying bile acids naturally present in the digestive tract of our birds. Though they tested eight probiotic strains for the ability to successfully modify the bile acids, only one strain demonstrated that ability, making the pathogens more susceptible to antibiotic treatments. I was pleased to learn that this probiotic strain is one of the twelve already found in our Bio-Fresh product.

Scientists have discovered that certain pathogenic bacteria has a stronger attraction (adhesion force) to some friendly bacteria strains, than they do to the intestinal lining. Using this information, one can select certain friendly bacteria strains to combat pathogenic bacterial infections. Since the attraction between the pathogenic bacteria and the friendly bacteria strain is stronger than the attraction (adhesion force) between the pathogenic bacteria and the intestinal lining, administering the correct friendly bacteria strains, can actually lift the pathogenic bacteria away from the intestinal lining and surround it with friendly bacteria.

The end result is a coagulated mass of layered pathogenic and friendly bacteria. Then the friendly bacteria releases their antimicrobial molecules which disrupt the pathogenic bacteria and keeps them from multiplying. These large aggregations of layered pathogenic and friendly bacteria can be swept away in the lumen and flushed out of the digestive tract.

One of the twelve friendly bacteria strains we use in Bio-Fresh, has been shown to be particularly effective using this method of adhesion / attraction forces and antimicrobial molecules to clear staphylococci and e coli infections.

Now, getting back to the reason I started this article in the first place, I just wanted to let you know that I ran tests to establish what, if anything, was the benefit derived from using the specific combination of prebiotics that I use in my Bio-Fresh and Bio-Booster products.

What the tests revealed is that the specific combination of prebiotics which I use in my Bio-Fresh and Bio-Booster products, produces a bloom effect on the 12 probiotic strains, increasing colony forming units, by about 400%. This benefit was realized when adding the Bio-Booster product to the Bio-Fresh product, at a 2 -1 ratio.

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