

ADVANCED BIOLOGICAL CONCEPTS®

APPLIED COMMON SENSE® • AQUAPONICS & AQUACULTURE • PRODUCT KNOWLEDGE

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Aquaponics & Aquaculture Product Knowledge is a continuing education series of guides that will help us on our journey towards a sustainable garden and farm. We all live on this beautiful and wondrous place we call earth. At Advanced Biological Concepts, our goal is to improve our lives through sustainable cultivation, understanding and education. We will explore how we can be good stewards of our planet while keeping our minds, bodies, animals and plants healthy.

Remember for your healthy mind and body, you are what you eat!

We will present most of our guides in easy to understand language, some issues will be geared towards the person just starting and some will be advanced that go into detail. We will learn as more information and technology becomes available and we will share it with you. We will listen to you, tell us what you want to know, we will do our best to cover topics and present them in future issues.

To start, we would like to share the ingredients we use in our signature blend:

Organic Fish Pellets



This product contains only certified organic agricultural products or ingredients that conform to the National Organic Program's national list of materials acceptable for organic livestock production.

Guaranteed Analysis

Crude Protein (min).....	31.000 %
Crude Fat (min).....	4.500 %
Crude Fiber (max)	8.000 %
Lysine (min)	1.250 %
Calcium (Ca) (min).....	0.700 %
Calcium (Ca) (max).....	1.200 %
Phosphorus (P) (min).....	0.400 %

Ingredients

Organic Canola Meal, Organic Sesame Seed Meal, Organic Corn, Organic Linseed Meal, Dicalcium Phosphate, Calcium Carbonate, Lactobacillus Acidophilus Fermentation Product, Organic Wheat Middlings, Organic Dried Kelp, Reed-Sedge Peat, Choline Chloride, Ferrous Sulfate, Manganese Sulfate, Zinc Oxide, Sulfur, Magnesium Oxide, Copper Sulfate, Calcium Pantothenate, Thiamine, Biotin, Sodium Selenite, Ethylenediamine Dihydriodide, Vitamin B12, Cobalt Carbonate, Organic Dried Tomato Pomace, Attapulgitic Clay, Diatomaceous Earth, Monosodium Phosphate, Organic Apple Cider Vinegar, Organic Dried Whole Milk, Organic Aloe Vera Gel Concentrate, Organic Potato Starch, Organic Dehydrated Eggs, Yeast Culture, Organic Lecithin, Potassium Chloride, Niacin, Sodium Sulfate, Copper Choline Citrate Complex, Ferric Choline Citrate Complex, Zinc Sulfate, Zinc Amino Acid Complex, Manganous Oxide, Manganese Amino Acid Complex, Ascorbic Acid, Vitamin A Acetate, Vitamin D3, Natural Source of Vitamin E (d-alpha Tocopheryl acetate), Riboflavin, Pyridoxine Hydrochloride, Carotene, Folic Acid, Cobalt Sulfate, Cobalt Choline Citrate Complex, Lactobacillus Acidophilus, Lactobacillus Casei, Bifidobacterium Thermophilum, Enterococcus Faecium, Potassium Citrate, Citric Acid, Calcium Sulfate, Magnesium Sulfate, Silicon Dioxide, Organic Sugar, Organic Sources of (Cayenne Pepper, Peppermint, Fabaceae Poaceae, Garlic, Parsley, Dandelion Root Extract, Licorice, Orange Peel Extract, Elder Flowers, Dandelion Extract, Ginger Extract, German Chamomile, Lemon Grass Extract, Thyme, Hops Extract, Sweet Fennel Extract, Sweet Basil, Sage, Cloves), Natural Antioxidants.

Food Born Disease

In our last issue we talked a lot about bacteria; good or beneficial bacteria. In this issue we will take a look at bacteria that can be harmful to people. In aquaponics there have been no known cases of Foodborne illnesses from the plants or fish; we want to keep it that way! We have all heard about E Coli and Salmonella making people sick and die; how does this happen? Where do the bacteria come from and how does it get into our systems?

One of the most well-known of these pathogenic bacteria is *E. coli* O157:H7, a strain that is one of the most dangerous to humans, and one which causes hundreds of thousands of illnesses each year. The sad fact is that fresh produce has become a very common source of *E. coli* O157:H7 since the first outbreaks were reported in 1991, associated primarily with spinach and lettuces. The *E. coli* is simply getting into the produce from organic farming using cow manure. Anyone who is immune-compromised, elderly, or very young is most susceptible to this strain, and ingestion of these bacteria can cause lifelong illness or even death. *E. coli* O157:H7 contains a toxin called Shiga toxin and is one of the most potent toxins known to man, so much so that the Centers for Disease Control and Prevention lists it as a potential bioterrorist agent. 1.4 million Americans are infected by salmonella each year, with a cost to the U.S. economy of around \$3 billion. This means 150,000 people are hospitalized and 600 die from the infection each year. Most Dangerous bacteria infect not only humans, but also our dogs and cats and many wild animals, some of which become ill, but most of which do not. These asymptomatic carriers shed billions of virulent infective organisms in every ounce of their feces. *E. coli* O157:H7 can persist for months in untreated animal waste and *Salmonella* for up to two years.

Composting

What do we do with the old plants and roots, excess fish waste solids (poopy) from our aquaponic system? How about a compost bin! There are lots of fruits, nuts, citrus and other plants we can not grow aquaponically. If possible have an earth based garden along with your aquaponic garden, it just makes sense. When we talk about “organic farming” we have to be responsible with what we are doing, we have to know what is happening in the “organic arena” we are constructing. While composting sounds like a good thing to do, if not done correctly it can harbor dangerous bacteria. If just one fly landed on some infected meat then landed on your compost it can deposit up to ten million salmonella bacteria per dropping! That’s enough to kill a healthy man; and some dangerous bacteria can survive for two years! The compost must be brought up to 160 degrees Fahrenheit for a minimum of 21 days to kill harmful bacteria. A good rule is to compost for 120 days before using it. All organic matter eventually decomposes. Composting speeds the process by providing an ideal environment for decomposing microorganisms, and the final product looks and feels like fertile garden soil. Decomposing organisms consist of bacteria, fungi and larger organisms such as worms and numerous other bugs. Don’t add worms unless you are sure they are from a clean source, they will probably get into the compost on their own.

Decomposing organisms need four key elements; nitrogen, carbon, moisture, and oxygen. Use materials high in nitrogen such as your harvested plants, roots and fish poopy. Also use pesticide/chemical free dried leaves and twigs. You want good nitrogen to carbon ratio. You can make or purchase a composting bin or use a plastic kiddie pool with holes drilled in it. You may need to water and cover the pile to keep it damp. Be careful not to saturate the pile. Turning or mixing the pile provides oxygen and frequent turning yields faster decomposition.

Happy Organic Gardening!

For comments, questions, or more information - Contact:

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