

## WHAT DO YOU WANT TO KNOW ABOUT HUMIC AND FULVIC ACID?

1. What are humic and fulvic acid?
2. How is humus made?
3. How are humic and fulvic acid created?
4. What effects do humic and fulvic acid have on humans, animals and plants?

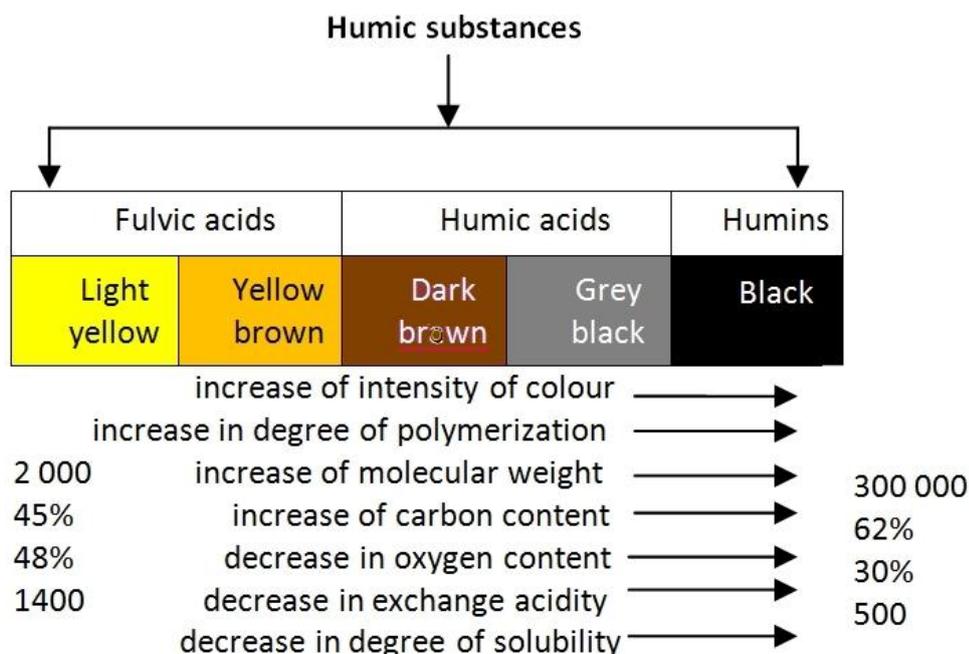
### What are humic and fulvic acid?

Fulvic acid is a natural carrier of nutrients. It takes nutrients, and deposits them inside the cell. In the cell it binds the heavy metals place, and transports them out of the off the body. Fulvic acid is capable doing so, by it's unique property that it is free to bind to nutrients and minerals. Moreover, it is so small that it can move through the cell membrane.

Fulvic acid is a liquid, extremely light molecule. Pure Fulvic acid is unbound. That means that it has no bound minerals and metals. These two properties, it's light weight and the unbound state of the molecule, make Fulvic acid an excellent carrier of minerals, vitamins, trace elements and metals. Fulvic acid is able to travel from cell to cell, deposit nutrients and take metals out of the cell (see box for the effect of fulvic to humans) Fulvic acid, like humic acid, is a generic name. This means that there are several products that are called Fulvic acid. But not all products have the same quality. A few rules of thumb to determine the quality of Fulvic acid:

- Pure Fulvic acid has a yellow colour. The colour indicates the purity.
- Fulvic acid should be as unbound as possible, so that it can bind to nutrients. A good way to determine the purity of Fulvic acid is taste. Fulvic acid should be tasteless.
- Fulvic acid is completely soluble. In water may thus constitute no deposition on the bottom.

### Assesment model humic substances



### WHAT IS HUMIC?

- Humic acid is a solid substance, but is completely soluble in water.

- Humic acid is extracted from humic substances. Humic acid is a molecule that binds with many other molecules.
  - Humic acid is bound. That means that there are minerals and metals bound to the molecules. This is in contrast to fulvic acid, which is unbound.
- Humic acid is a generic name.
  - There is considerable variation in the quality of humic acid. And the definition of humic acid is quite different per provider. Some sellers see humic acid and fulvic acid as a substance.
- A rule of thumb for the quality of Humic Acid to judge the colour. The darker the colour, the more minerals it binds. Dark thus refers to wealth.

## How are humic and fulvic acid created?

Humic and fulvic acid arise from humus. Humus is the top layer of the soil. It's very fertile. It looks like compost, but is further digested than compost. It consists of organic digested plant and animal materials. As plant material degrades into compost, humus substances are created. From Humus two substances can be extracted:

- Humic acid;
- Fulvic acid;
- Humin.

## WHAT IS HUMIN?

What remains after humic or fulvic acid are extracted from humus is called Humin. It basically has the same properties as humic acid, but it's a waste product, and much less effective.

## How do we consume fulvic acid?

Every human consumes Fulvic acid through vegetables. However, through the use of fertilizers, pesticides but also by age of agricultural lands, the humus layer is gradually withdrawn from the bottom. This gives the person less fulvic acid in a natural way.

## How humic and fulvic acid extracted?

When plants die, they are broken down. This process is called humification. Many people know this form of degradation in compost. The forming of compost is a way of humification. Under the right conditions fruit and garden waste are broken down into compost, which serves as fertilizer. The humification of compost can be completed in 6 months.

On the contrary, the humification of humus takes much more time. Moreover, the breakdown goes much further than compost. The humus layer consists of many remains of plants and animals. These organic particles are called humic substances.

Humic substances are everywhere to be found in water and soil. In some places, the available humic substances are present in a higher concentrated amount than others. Humus is basically a high concentration of humic substances. Some humic layers are so concentrated that they can be mined.

## HOW LONG DOES IT TAKE TO FORM HUMUS?

It takes at least 6-12 months to form a humus-like substance as compost, but in nature it takes much longer to form a humus layer. A humus layer can be 40 million years old. A rule of thumb about the quality: the older the better.

How are humic substances also called?

On this website the terms humic acid, fulvic acid and humic substances Humin used to denote all. Other names are:

- Humates
- Leonardite
- Humalite
- Colloidal minerals
- Concentrated humic
- Humic acid
- Fulvic Acid

How are humic and fulvic acid withdrawn from humic substances?

The production varies greatly from vendor. That's why the quality of products can vary greatly with every supplier. Below, the production of fulvic acid is described in the way BioAg, the supplier of the Health Solution produces fulvic acid.

1. Crude ore arrives at the facility, in large sealed bags.
2. The bags are emptied in fermentation vessels (the same as used in the wine industry).
3. Rainwater, enzymes and microbes are added.
  - The enzymes provide for the separation of fulvic acid in the humus, a process that is called fermentation. The microbes prevent bacteria like e-coli from getting foothold in the barrels.
4. The fermentation process takes several months.
5. Tests are performed during the process to check if the product is right acidity, density, color and consistency has been reached.
6. After the fermentation process is completed, all containers emptied into a large tank
7. The tank is then used to fill 275 litres cage trays through a patented filtering system that prevents any risk of contamination and removes all microbes.
8. Each load gets a lot number, so that all products can be controlled.
9. When the big tank is empty, the process begins again.

What effects do humic and fulvic acid have on humans, animals and plants?

Effect of fulvic acid in humans and animals?

- Improves the absorption of nutrients  
Fulvic acid is a conveyor. It binds vitamins, minerals and trace elements and transports it through the body. This improved the absorption of nutrients.
- Transports heavy metals out of the body  
Fulvic acid is a chelate. That means that it not only binds organic materials, but also inorganic material. In this way inorganic matter like heavy metals are transported out of the body.

Effecten of fulvic acid on animals?

- Optimization of feed conversion  
Feed conversion is the efficiency of digestion. More nutrients are absorbed, less undigested nutrients are discharged.
- Firmer stools  
Humic acid binds dust particles, similar to carbon. This gives your pet a firmer stools.

- Excrement stinks less  
Because the feed conversion improves the digestion, emission of methane and sulphide are reduced. Sulfur and methane are the cause of the stench of excrement.
- Noticeable effects after two weeks

#### Effecten of humic and fulvic acid on the bottem?

- Makes the soil more fertile.
- Absorbs nutrients from the soil and, especially phosphorus, sulfur, and carbon dioxide
- The need to add carbon dioxide is reduced
- Stimulates biological activity
- Dissolves minerals
- Improves soil structure

#### Effecten of humic and fulvic acid on plants?

- Accelerates and enhances the growth of plants  
The nitrogen and nutrient uptake is increased. This will promote the metabolism and will help a plant grow faster.
- Reduces the risk of disease.  
Humic acid provides a stable base. The plant grows up in better circumstances, and is therefore more resistant to diseases