



### Powdered Cellulose Ingredient Status

In May 2016, the FDA published a final rule which provided a definition of dietary fiber and increased the DRV from 25 to 28 grams. The new rule included by reference, a list of isolated fibers that meet the new definition of dietary fiber. Cellulose was included on that list and no further petitions are necessary to use cellulose as a source of dietary fiber for nutrition labeling or claim purposes.

Sweetener Supply Corp powdered cellulose meets the monograph described in the Food Chemicals Codex for "Cellulose, Powdered." It will also meet the JECFA and EU Monographs for "powdered cellulose." It is commonly used as an anti-caking agent, bulking agent and fiber source in food products.

Cellulose, powdered cellulose, and microcrystalline cellulose do not appear in 21CFR as regulated or GRAS. Powdered cellulose is considered to belong in the "prior sanctioned category" as a food additive in use prior to the passage of the Food Additives Amendment in 1958. It is considered "grandfathered" and permitted by FDA. In the EU, Powdered Cellulose is listed under Commission Regulation (EU) No 231/2012 of 9 March 2012. E 460 (ii) Powdered Cellulose.

FDA also lists "cellulose, regenerated" as approved under 21CFR 176.170, Indirect Food Additives, Components of paper and paperboard in contact with aqueous and fatty foods. Identity standards for hot dogs are described at 9 CFR 319.80 (FSIS, 2000).

The Association of American Feed Control Officials (AAFCO) lists powdered cellulose at 87.14 as a "special purpose product (anti-caking agents, color additives, condiments, grinding agents, pelleting agents, etc.)."

Even the "Center for Science in the Public Interest" lists cellulose as a safe ingredient.

<http://www.cspinet.org/reports/chemcuisine.htm>

The FCC grade powdered cellulose produced by Sweetener Supply Corp. is manufactured from virgin wood-based pulp, processed using the "Kraft" pulping process in the USA. The material is bleached using an elemental chlorine free process. Neither  $Cl^-$  or  $Cl_2$  are used as bleaching chemicals in the process. The raw material for this process is naturally occurring trees. Neither the FCC nor JECFA monograph specify or require the use of a specific plant substrate to produce powdered cellulose.

Cellulose is the most widely found natural polymer in nature. It is the major component of rigid cell walls in plant material. Almost all structural plant material will contain cellulose. In addition, cellulose can be produced thru a fermentation process, but this has never been economically viable. There are many plant by-products readily available or grown specifically for cellulose that are more feasible economically.

Cellulose is a polymer chain made up of glucose units. The component monomer of a cellulose chain is exactly the same as the components of starch, glucose units. The only difference is the linkage point in the chain, which determines whether humans can digest the chain into the individual sugar monomers or not. If it is not digested, then it is considered a dietary fiber.



Some animals do possess the ability to digest cellulose. Cows for example can digest cellulose into energy and it generally makes up a large portion of their diet.

Cellulose can be extracted from virtually any structural plant material. Dry beans and peas typically have around 4-8% cellulose. Cotton is essentially pure cellulose. A large portion of most people's wardrobe is in fact cellulose.... Cabbage is around 10% cellulose on dry matter basis. A large portion of the insoluble dietary fiber consumed in the world is from cellulose. It is what in years past would have been called roughage. In North America, the primary source of cellulose is a product of the forest industry and from cotton. In other parts of the world other plant substrates are used like bagasse (sugar cane stalks), bamboo, hemp, switchgrass, wheat straw, corn stover. The end products are chemically identical, the only difference is the starting plant. The food grade standards, don't dictate the source. They only give the purity standards the final product must meet. The cellulose is created by the plant. The processing done to make powdered cellulose is simply an extraction and purification process. It does not add anything that wasn't already there. It simply removes the non-cellulose fractions from the plant source.

There seems to be some concern about one of the sources being from trees. However there are a lot of common food items that are also sourced from parts of trees. Some of these include:

- a. Tree Nuts - Walnuts, Almonds, Pecans, Coconuts....
- b. Fruits - Apples, oranges, peaches, pears, .....
- c. Cinnamon - ground inner bark of a tree
- d. Tea - Extracted from the leaves of tree
- e. Sassafras - extracted from bark and roots of a tree for drinking
- f. Carob/Locust Bean gum - extracted from the seeds of a carob tree
- g. Maple Syrup - Extracted from the sap of a maple tree
- h. Gum Arabic - Extracted from the sap of an acacia tree
- i. Eucalyptus - Extracted from tree leaves
- j. Coffee - Extracted from the bean of the coffee tree
- k. Pine Nuts - roasted and eaten

The trees commonly used to produce cellulose are specifically grown in sustainably certified forests. Unlike common crops such as corn, soybeans etc. these forests don't use large amounts of fossil fuels for cultivation, don't use GMO seeds, don't use pesticides and provide a habitat for wildlife. A common misconception is that cellulose is a low cost filler. In fact it is much more expensive than other common carbohydrate sources like flour, sugars and starches. It is used in many products for its unique functional and nutritional properties and safety.

Regards,

A handwritten signature in black ink that reads "Jon Bodner".

Jon Bodner  
VP of Food Technology  
Sweetener Supply Corp.