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Anti-caking Agent Use and Limits in Grated and Shredded Cheese

Sweetener Supply has received numerous questions regarding the use and limits of anti-caking agents which may be applied to shredded and grated cheese.

The use of anti-caking agents in grated cheese is specified in the Code of Federal Regulations, 21 CFR 133.146. Part (c) (2) allows the use of anti-caking agents in grated and shredded cheese. No direct limitation on maximum use is given, other than they must safe and suitable.

Although no direct limits are given, indirect limits are built into 21 CFR 133.146. In (b) (2), the code states that the milkfat content of the grated cheese cannot be more than 1% lower than the minimum prescribed by the standard of identity for that cheese. Part (b)(3), describes the use of the arithmetical average milkfat content if more than one variety of cheese is used with the additional requirement that in no case shall the milkfat content be less than 31%.

Using parmesan cheese as an example, the standard of identity for parmesan cheese is contained in 21 CFR 133.165. The minimum milkfat content of parmesan cheese listed in part (a) is 32% milkfat in solids basis. The method to determine the milkfat % in solids is listed in 21 CFR 133.5.

As a reference example, the USDA Nutrient Database is applied:
http://ndb.nal.usda.gov/ndb/foods/show/33?fgcd=&manu=&lfacet=&format=&count=&max=35&offset=&sort=&qlookup=

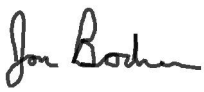
Parmesan cheese listed in the USDA table has a typical moisture content of 29.16% and a fat content of 25.83%. Using the method described in 21 CFR 133.5, the milkfat in solids of this typical parmesan cheese is calculated to be 36.5%

100%-29.16%=70.84% solids 25.83%/70.84% =36.5%

As stated above, the minimum milkfat content for parmesan cheese is 32%. The use in grated/shredded cheese lowers that limit to 31%. A "typical" parmesan cheese as listed in the USDA Nutrient Tables has a milkfat content in solids of 36.5%, which theoretically leaves 5.5% available for the optional ingredients listed in 21 CFR 133.146 (c), which includes antimycotics (mold inhibitors), anti-caking agents (cellulose, starch), spices and flavorings.

That said, the actual milkfat in solids content of the starting cheese would need to be known and controlled to determine the actual level of optional ingredients that could be added to a specific grated cheese while maintaining regulatory compliance. A lower milkfat in solids level in the starting cheese could significantly limit the amount of optional ingredients that could be added. For example, starting with a lower end 32% in solids milkfat parmesan cheese block, the optional ingredients, including the anti-caking agent for grated cheese, would be limited to 1%.

Verification for regulatory compliance with 21 CFR 133.146 Grated Cheese, is based on the minimum milkfat content of the cheese and not on the absolute level of optional ingredients (including anti-caking agents).



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2/19/16

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Powdered Cellulose Ingredient Status

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.

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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. theses 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,

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