

# Ridgeland® Anti-Caking Agents for Shredded and Grated Cheese



Consumer acceptance and demand for shredded cheese has been a contributing factor in the growth of the overall cheese market. According to Rosemont, IL based Dairy Management Inc., per capita consumption of cheese has doubled in the past 25 years. With the increased market for shredded cheese there has been more research done to optimize the efficacy and economics of the anti-caking agents used in the shreds.

A typical shred line consists of a cutter to reduce the block size into chunks which are fed into the shredder. The shredder deposits the shreds onto a belt conveyor which feeds the cheese into the tumbler. An electronic "eye" mounted on the belt conveyor just prior to the tumbler would be tied to a controller on a volumetric (screw) type feeder. When the line is running, the electronic "eye" would see the cheese on the belt conveyor and turn on the volumetric feeder and deliver anti-caking agent to the tumbler. Ideally, the tumbler would be fitted with a shroud at both ends to minimize the opening size. A vacuum system attached to one shroud would pull a slightly negative air pressure in the tumbler and prevent fugitive dust from escaping. The shrouds do not need to seal tightly against the tumbler. They only need to minimize the opening size in order to increase the inlet air velocity into the tumbler and prevent excessive dusting.

Historically microcrystalline cellulose (MCC) was used as an anti-caking agent in shredded cheese. MCC is very effective at preventing lumping and sticking of the cheese as well as being easy to use in a plant environment. As the shred market evolved, and the market became more competitive, manufacturers began to look for more economical alternatives to MCC and soon began replacing MCC with powdered cellulose. Powdered cellulose offered a similar label declaration, and very good anti-caking properties. It was also much less expensive (1/2 the price) than MCC.

Powdered cellulose is an effective anti-caking agent when applied on the cheese at a rate of 0.75-1.5%. Levels higher than 1.5% can be used, but increased visibility of the cellulose on the cheese at those levels can have a negative consumer perception. The flow characteristics for powdered cellulose are not as good as MCC so more care must be taken in the selection of the volumetric feeders. Feeders with mechanical type hopper agitation are always recommended instead of vibration.

After a number of years using powdered cellulose as the primary

anti-caking agent, the market shifted again. The use of starch based products in conjunction with powdered cellulose represented a paradigm shift for the industry. Originally starches were not thought of as ideal anti-caking agents in cheese. The efficacy of starch as an anti-cake is not generally on par with cellulose when compared on a pound for pound basis. The starches are not as absorptive, and being less dense, they don't provide the degree of physical separation/coating like powdered cellulose. Potato starch in particular though, offered a distinct advantage over powdered cellulose, invisibility. Potato starch is a large round granule that hydrates very quickly. When hydrated, the potato starch becomes translucent. In a cheese shred anti-cake application, the potato starch can pull enough moisture from the cheese/atmosphere to become hydrated and disappear. This allows the application of potato starch onto the cheese at much higher rates than previously used for powdered cellulose. The actual anti-caking properties of potato starch are less than stellar, but when combined with powdered cellulose, it is possible to take advantage of the benefits of both products.

The anti-caking agent can also be an effective means of dosing anti-mycotics onto the cheese to extend shelf life. In the past, sorbates, propionates and oxygen scavenger blends have all been used to extend the shelf life of shredded cheese. Today the preferred preservative technique is the use of Natamycin combined with modified atmosphere packaging. Natamycin is limited to a maximum use level in shredded cheese of 20 ppm. Typical used levels tend to be in the 5-10 ppm range. The natamycin can be applied either in the dry form or as a suspension in water as a spray. Using the spray form requires extra equipment (pumps, tanks & controls) and space in the shred line area. The natamycin is not very soluble and generally must be suspended in the tank with agitation or the use of gums. The main advantage of a spray system is the cost advantage provided by the addition of extra water to the product. Natamycin can be added in the dry form to the cheese, usually as part of the anti-caking agent blend. Using this method, consistent finished product natamycin levels and mold protection can be achieved without any extra capital expense, space or maintenance.

Sweetener Supply Corp offers wide array of cheese anti-caking solutions under the Ridgeland Fibers® name. We are happy to provide assistance on product selection, packaging options and equipment to meet anti-caking needs.



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