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The Concept of Different Natural Antibacterials for the Sugar Industry

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Abstract:

During the last decade hop beta acids have been used in the sugar industry as a natural antibacterial aid, in order to control thermophilic or other Gram-positive micro-organisms. As a consequence of a very specific antibacterial action, these natural products are considered harmless to human beings, as they are regularly consumed in food. Additionally they are biodegradable in the environment. However, micro-organisms may become insensitive to natural products after repeated application and alteration with chemicals was sometimes necessary in the past. In 2002, rosin acids were presented as a natural supplement to hop beta acids. Now palm kernel fatty acids and especially the most effective myristic acid are introduced to the sugar industry, which could again be used to displace adapted strains. After a survey of existing literature, results of laboratory trials were carried out to demonstrate the mechanism of action, as well as influences of chain length, temperature, pH etc. Further, results from full-scale factory trials during the beet campaigns 2002 and 2003 are presented. During 2002, a rosin-insensitive strain occurred in a beet extraction tower and could be eliminated by shock dosing of myristic acid. This result already stresses the importance of natural alternatives for elimination of adapted strains, to keep the level of fermentation low in every case. In 2003 satisfactory effects were achieved with myristic acid in two other Agrana factories. The new product is precipitable with Calcium and mainly removed from the process stream via pulp, lime sludge and molasses.

The complete text is available in English.