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Condensed molasses solubles

General introduction

Put simply, condensed molasses solubles (CMS) are by-products of various fermentation processes. Molasses is used as a nutrient substrate in many fermentation industries (e.g. yeast, alcohol and amino acid production and the production of organic acids). In these processes, most of the sucrose content of the molasses is consumed by microbiological action. The resulting liquid waste (known variously as slop, stillage, distiller's wash or vinasse) has very little residual sugar content. It is this waste which is condensed, further processed and marketed as CMS.

Applications

CMS is used primarily in feed products for cattle and sheep because its crude protein content consists mainly of NPN (nonprotein nitrogen compounds such as free amino acids and betaine). Only ruminants are capable of synthesizing NPN into protein. CMS is also of interest because of its mineral content, most notably potassium.

In cattle feed, CMS is used in admixtures of about 3-4%. In pig and chicken feed, 1-2% is sufficient because in these cases it functions mainly as a binding agent rather than as a protein replacement.

CMS can also be processed into value-added products by enrichment with other substances, such as proteins.

CMS can be added to animal feed either directly or indirectly by mixing with another product, such as cane molasses. There are few if any palatability problems, and use as a feed for cattle, pigs and poultry should not cause any problems. CMS lends itself well to mixing with feed molasses because its low viscosity reduces the mixed viscosity of the resulting feed molasses product. The major benefit to sellers is that the decrease in the mixed viscosity of the finished feed molasses is superproportional to the rate of CMS addition. Mixing CMS with molasses is also commercially advantageous for sellers because CMS is significantly less expensive to buy than molasses.

CMS is also used as a nitrogen-potassium fertilizer, particularly in only mildly condensed form or completely non-condensed vinasse form (i.e. 35-50% solids). CMS/vinasse in these forms is sprayed onto fields. The volumes of CMS/vinasse used as fertilizer vary considerably from region to region within Europe owing to differences in the volumes of molasses fermented and the quantities of vinasse produced. Across Europe as a whole, more CMS/vinasse is used in animal feed than is sprayed on fields as fertilizer – especially when beet and/or cane molasses is comparatively expensive

Quality

CMS can be broadly classed into sugar cane CMS and sugar beet CMS, corresponding to the use of both cane and beet molasses in the fermentation industry. Accordingly, these two types of CMS vary in their composition. Sugar beet CMS contains more protein, measured in terms original NPN, than sugar cane CMS because the original sugar beet (and hence the original sugar beet molasses) has a higher protein content. It also contains betaine, which is absent in sugar canes. Similarly, there are significant variations in composition within these two broad classifications of CMS because of the different types of molasses fermentation processes used.

CMS contains all the nutrients that the original sugar cane and beet plants absorbed from the soil (although magnesium and, in some cases, phosphorous are present only in trace quantities). Of particular importance are organic nitrogen and potassium (K₂O), with concentrations of 4.5% and 6-9%, respectively, by fresh substance.

Quality assessments of CMS typically focus on the percentages of solids, crude protein, digestible protein, potassium, sodium, ash and betaine.

The solids content generally ranges between 58 and 70%.

65% or higher solids	Good quality
57-58% solids	Average quality
51-52%	Poor quality

CMS quality varies according to solids content as per the following rules of thumb:

Alongside protein value and energy value, water content is also an important factor when assessing the quality of CMS. The higher the water content, the greater the risk of fermentation by osmophile yeasts. Mould formation is also a risk. Therefore, correct handling and storage are especially important when using highly liquid forms of CMS.

Sugar beet CMS has a very low fermentable sugar content. Therefore, under normal conditions this type of CMS should not be affected by fermentation, provided it is stored correctly.

Products

At present, much of the trading is in European, certified ethanol CMS derived from sugar beet. There are a number of products. We would be only too happy to send you an analysis on request.

All information and advice in whatever form regarding possibilities of processing or using our products, as well as presentations or otherwise providing information - also in respects of possible rights of third parties - is given to the best of our knowledge on the basis of research work and experience. It is not, however, binding on us and all liability on our part is excluded. The purchaser is not released from the burden of carrying out his own tests and experiments. Furthermore, our sales and delivery conditions will apply accordingly.

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