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FORMULA TO CALCULATE THE INVERT SUGAR CONTENT BASED ON THE GLUCOSE CONTENT OF SUGAR BEET

Formule pour déterminer la teneur en sucre inverti, basée sur la teneur en glucose de betteraves sucrières / Formel zur Bestimmung des Invertzuckergehalts auf Grundlage des Glukosegehalts von Zuckerrüben

ABSTRACT

The invert sugar content of sugar beet increases with increasing storage period and storage temperature, thereby decreasing the processing quality of the beets substantially. Invert sugar results from the enzymatic degradation of sucrose to glucose and fructose. Recently, a new method has been developed to determine the glucose content of sugar beet in the routine. The objective of the present study was thus to develop a formula to estimate the invert sugar content based on the glucose content of freshly harvested and stored sugar beet.

The results showed a close linear relationship between invert sugar and glucose content in freshly harvested and stored beet, as the ratio of glucose to fructose is constant. The topping quality as well had no effect on the glucose to fructose ratio of freshly harvested and stored sugar beet. By using the linear regression function (invert sugar = 2*glucose - 1.5 in mmol kg⁻¹), the invert sugar content of an independent dataset was calculated based on the glucose content. The estimated invert sugar content was closely correlated with the invert sugar content measured by HPLC. Thus, the invert sugar content in freshly harvested and stored sugar beets can be calculated. This could considerably improve the quality assessment of sugar beet once the new method to determine the glucose content will be implemented in the routine analysis of sugar factories. The given formula has to be evaluated with data of the glucose determination with the new method in the factories.
