



ENZECO® INVERTASE AN USE IN CONFECTIONS

BACKGROUND

ENZECO® INVERTASE AN is a liquid enzyme preparation derived from *Aspergillus Niger*. It hydrolyzes sucrose into glucose and fructose. This process will convert a crystalline sucrose solution into a liquid, often referred to as invert sugar. This is a necessary step in the manufacture of certain confectionery products including truffles and other chocolates with cream centers.

ADVANTAGES TO USING ENZECO® INVERTASE

Producing this type of confection involves the manufacture of a center, usually through starch molding, which is then enrobed in chocolate. The center must be firm enough to withstand the handling and processing, yet will soften to a desirable creamy consistency by the time the consumer eats the product. Invertase causes this transformation, by converting the crystalline sucrose present in the center, to the syrup phase. It would not be possible to handle a cream consistency directly from the starch molds, without the use of Invertase.

In addition to the softening that occurs, there are other benefits to this type of process. The fructose that is generated is hygroscopic, and helps to minimize the drying of the confection. This, in combination with the prevention of sugar crystallization, will increase the shelf life of the product by maintaining a desirable consistency for an extended period of time. Also, the process reduces the water activity, which helps to minimize microbial growth and contamination.

APPLICATIONS AND PROCESSING

The center can consist of many different components. These include dairy cream, milk products, chocolate, sugar, corn syrup, starches, egg albumin, gelatin, fruit pieces, nuts, flavors, acids, colors, and Invertase.

It is important to consider the activity or strength of the Invertase, before substituting Invertase from one supplier for another supplier's Invertase. ENZECO® INVERTASE AN has an activity of 15,000 Sumner Units per gram. An Invertase described as "Single Strength" is approximately 3,000 Sumner Units per gram. "Double Strength" Invertase is approximately 6,000 Sumner Units per gram. At 15,000 Sumner Units per gram, ENZECO® INVERTASE AN is more than 5 times the strength Invertase.



Enzyme Development Corporation

It is also important to take into account that ENZECO[®] INVERTASE AN is from *Aspergillus Niger* instead of the yeast *Saccharomyces cerevisiae*. A benefit of having the Invertase come from *Aspergillus Niger* is that it gives the enzyme adding heat and acid stability. This Invertase can be added to Fondant that has a pH 3 and a temperature of 85°C.

In new formulations, a starting point for the amount of ENZECO[®] INVERTASE AN would be 0.002 - 0.02%. However, more or less may be needed depending on the components of the center, and the amount of time that the product has to react – the more Invertase, the sooner the center will soften. There is not a risk associated with overdosing the Invertase. When all of the inversion has occurred, the reaction will stop, and the end-point has been met.

The components of the flavors, acids, and possibly colors may react with the Invertase. Therefore, it is recommended that all of the components be thoroughly mixed together, **before** the Invertase is added. It may be necessary to reheat the mixture to the melting temperature before adding the Invertase to ensure that the Invertase has an opportunity to be thoroughly mixed. ENZECO[®] INVERTASE AN performs optimally at a temperature range of 70- 85°C, and is rapidly deactivated at temperatures greater than 90°C. Therefore, it is recommended that the Invertase be added after the cream mixture has fallen below 85°C.

The inversion will begin immediately, however the full softening of the center may not occur for 1-2 weeks. If a more rapid softening is required, additional Invertase should be added.

CONCLUSION

Cream-centered confections are a high quality, highly desirable treat, because of their rich taste and creamy mouth feel. Consumers are usually willing to pay a high price for these products, because of their taste and quality. Therefore, it is in the manufacturers' best interest to make these products using ingredients such as ENZECO[®] INVERTASE AN, which will help to optimize that quality.



SAMPLE FORMULATIONS

Chocolate Butter Creams

Fondant Sugar	77.8%
Water	10.0%
Salt	0.2%
Butter	4.5%
Chocolate Liquor	7.5%
Flavor	To taste
Enzeco® Invertase AN	0.002 to 0.02%

- In a saucepan or metal container, Mix the fondant sugar, water, salt and flavor until thoroughly mixed.
- Cook the sugar mixture until it reaches a softball stage, 240°F
- Pour mixture onto a cookie sheet or marble slab, and with a wooden spoon makes the mixture in a figure 8 motion until it “creams” and forms the fondant.
- In the saucepan, melt the chocolate liquor and butter together, then remove pan from the heat.
- Add to the Fondant back to the pan and keep mixing until all ingredients are well blended, applying heat if necessary.
- Add invertase and flavor an after temperature has cooled to at less than 85°C.
- Deposit centers while warm into starch bed or mold; or form centers after the mixture has cooled and formed.
- Enrobe firm centers with chocolate.

Basic Fondant Centers

Fondant Sugar	72%
Water	20%
Corn Syrup	7.9%
Flavor, Color, Acid	As desired
Enzeco® Invertase AN	0.002 to 0.02%

- In a saucepan or metal container, Mix the fondant sugar, water, salt and flavor until thoroughly mixed.
- Cook the sugar mixture until it reaches a softball stage, 240°F
- Pour mixture onto a cookie sheet or marble slab, and with a wooden spoon makes the mixture in a figure 8 motion until it “creams” and forms the fondant.
- Add to the Fondant back to the pan and heat until it melts
- Add invertase, Acid, Color and flavor an after temperature has cooled to at less than 85°C.
- Deposit centers while warm into starch bed or mold; or form centers after the mixture has cooled and formed; or dip cherries/fruit and place on parchment to dry.
- Enrobe firm centers/fondant covered fruit with chocolate