

Enzymation

Amylase AG 300 L

Degradation of Starch in Fruit Juices

Amylase AG 300 L enzyme is a fungal glucoamylase, produced from a selected strain of *Aspergillus Niger*. Amylase AG 300 L enzyme acts as a catalyst for the step-by-step hydrolysis of 1.4-alpha bonds in starch, with glucose being separated at the non-reducing end of the molecule. Amylase AG 300 L enzyme also acts as a catalyst for the hydrolysis of 1.6-alpha bonds, although this is slower than the hydrolysis of 1.4-alpha bonds. The addition of Amylase AG 300 L enzyme therefore enables almost complete conversion of liquefied starch into glucose.

Apple and pear juices used in the fruit juice industry may contain relatively large quantities of starch, particularly at the start of the harvest. For the production of clear fruit juices, this starch has to be hydrolyzed, in order to prevent secondary hazing in the concentrate.

Application and Function

The dosage of Amylase AG 300 L enzyme depends on the starch concentration in the fruits. The starch content depends on the season. Starch causes problems during clarification and filtration of juices and may lead to secondary hazing in the end product. If a clear juice or a clear concentrate is to be produced, the starch, if present, has to be broken down prior to storage of the juice or concentrate. Starch, which is present in the fruit mainly in crystalline form, is dissolved (gelatinized) during heat treatment (at temperatures above 131 – 140 °F (55 – 60 °C), i.e. in the flavoring system during pasteurization and concentration). Dissolved starch can be broken down enzymatically (e.g. with Amylase AG 300 L enzyme) into glucose. Starch detection and degradation should be monitored via an iodine test:

- Heat 2.7 fl dr (10 ml) juice to more than 176 °F (80 °C, this is not necessary if the sample is taken directly from the flavoring system) and cool to room temperature.
- Carefully apply approx. 0.27 fl dr (1 ml) of iodine solution to the surface of the juice without mixing. Determine the color of the boundary layer (reaction zone).

(Iodine solution: Solution of 0.56 dr (1 g) of iodine and 5.6 dr (10 g) potassium iodide in 33.81 fl oz (1 l) of water)

Evaluation

1. No change in color of the iodine solution (reddish-brown)
= no starch
2. The iodine solution changes color to brown
= partly hydrolyzed starch
3. The iodine solution changes color to blue, dark blue or black
= starch

Mash Recommendation – Dosage

Application	Dosage
Juice after the flavoring system or heat treatment	0.26 – 3.84 fl oz/1,000 gal (0.2 – 3 ml/100 l)

Enzyme Application

The active enzyme components of Amylase AG 300 L enzyme are easily soluble in concentrations occurring under normal working conditions. The preparation may become hazy, although this has no influence on the activity of the product or on its handling.

The product should be mixed in cold, clean water with a ratio of 1:5 to 1:10. It can be added to the enzymation tank during filling, or via a dosing unit with the product flow.

Temperature

Due to the reduced enzyme activity, temperatures below 50 °F (10 °C) should be avoided.

Safety and Purity

Amylase AG 300 L enzyme meets the specifications of FAO/WHO (JECFA and FCC) for enzymes in the food industry. When used and handled correctly, there are no known health risks associated with the product.

Amylase AG 300 L enzyme has a standard activity of 1,109 AGU/fl dr (300 AGU/ml).

Descriptions of the analysis techniques and Material Safety Data Sheet are available on request.



After sterile filtration, Amylase AG 300 L enzyme is bottled aseptically and is therefore practically germ-free. Amylase AG 300 L enzyme is a brownish, liquid enzyme preparation. It is free from preservatives and has a density of approx. 10.015 lb/gal (1.2 g/ml) and the typical odor of fermented products.

Storage

The recommended storage conditions are 32 – 50 °F (0 – 10 °C) in intact packaging and protected from the sun. The product is formulated for optimum stability. However, enzymes gradually lose their activity over time. Prolonged storage and/or adverse storage conditions, including higher temperatures, may mean that a higher dosage is required.

Delivery Information

Amylase AG 300 L enzyme is sold under article no. 95.049.010 and is available in the following package size:

0.26 gal (1 l) PE bottle

Certified Quality

Amylase AG 300 L enzyme is regularly monitored for uniformly high product quality during the production processes. These inspections cover technical function criteria as well as conformance with relevant laws governing the production and sale of foodstuffs. Strict controls are carried out immediately before and during final packaging.

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