

Determining the amino acid profile of beer using post column derivatization with ninhydrin



Introduction

Beer is brewed after liquid gelatinization and saccharification, and then liquid fermentation. The main raw materials of beer are wheat malt and barley malt, and hops is also added during the process. Beer has low alcohol content and high nutritional value. The ingredients include water, carbon dioxide, a variety of amino acids, vitamins, low molecular sugars, inorganic salts and various enzymes. These nutrients are easily absorbed and utilized by the body. The low molecular sugars and amino acids in beer are easily digested and absorbed, and generate a lot of heat in the body, so beer is often called "liquid bread". 1L of 12 % beer can

produce 3344 kJ of calories, which is equivalent to the calories produced by 3-5 eggs or 210 g of bread. A light manual worker can obtain one-third of the calories he needs, if he drink 1L of beer a day.

The amino acids in beer are produced by the decomposition of protein contained in raw barley through the action of enzymes. Its content is very rich, and it exists in a dissolved state, and is indispensable for human nutrition. 17 kinds of amino acids have been analyzed in beer. 7 kinds of them cannot be synthesized by the human body, and they are indispensable. If they are lacking, many diseases will be easily caused. Beer contains peptides and amino acids that balance human nutrition. Each liter of beer contains about 3.5g of peptides and amino acids, hydrolysis of the protein, which can be almost 100% digested, absorbed and utilized by the human body.

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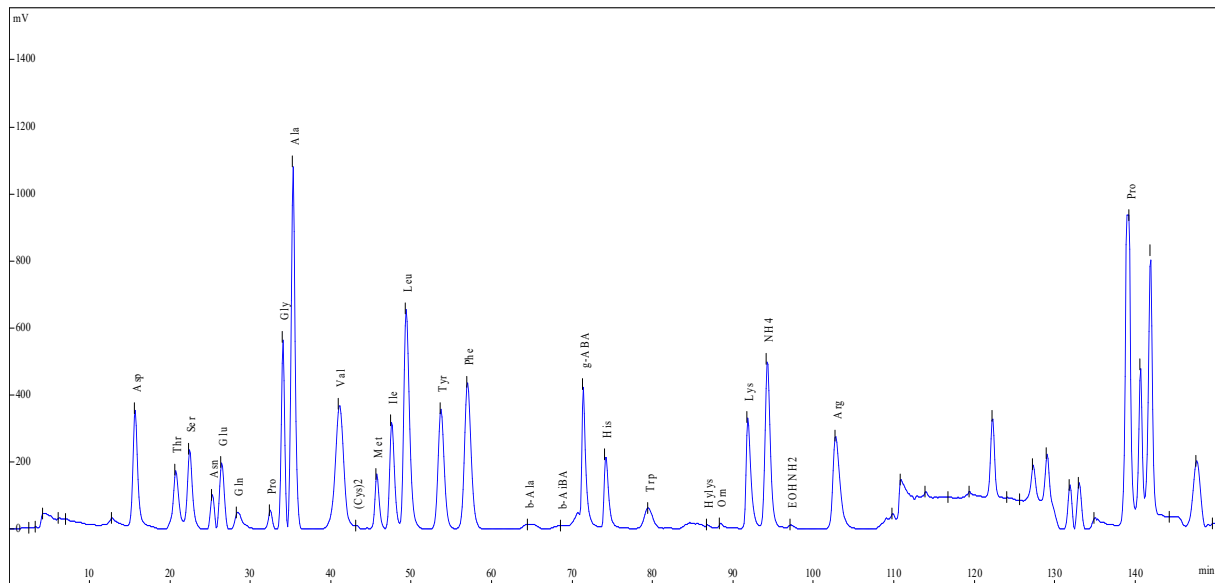


Figure 1: The sample was placed in sample dilution buffer and subjected to protein precipitation by adding precipitation solution. After the sample was filtered and centrifuged, the free amino acids were separated using a lithium cation exchange column and then derivatized with ninhydrin. The detection was performed at 440 nm and 570 nm. The concentrations of the individual amino acids were determined using a known concentration of a standard amino acid mixture.

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