Yeast Extract with natural nucleotides

Background and definition
In 1960 Dr Kunikawa discovered that 5'GMP (guanosine mono phosphate) has a flavour-enhancing property (umami : also known as the 5th taste). Since yeast is rich in ribonucleic acid (RNA), a natural source of 5'GMP, Yeast Extract manufacturers started research with the aim to break down the yeast RNA into 5'nucleotides, including 5'GMP. In 1974 the first commercial Yeast Extract containing 5'GMP was produced on an industrial scale. Today, Yeast Extracts are available with various contents of two natural taste enhancing nucleotides : 5'GMP and 5'IMP (inosine mono phosphate).

Applications
Yeast Extracts with natural nucleotides can be used in a wide range of food applications, in particular as savoury taste enhancers in soups, sauces, snacks and ready-to-eat meals. Because of the enhanced savoury taste, sodium chloride levels can be reduced : this perfectly fits into the trend of reduced sodium and healthy food. Moreover, Yeast Extracts with natural nucleotides can improve the taste and mouthfeel of low fat food formulas.

Production process
During a normal autolysis process, the yeast's own enzymes break down the yeast RNA into nucleosides and nucleic acids, which have no flavour-enhancing properties whatsoever. Therefore the first step in producing a Yeast Extract with natural nucleotides consists in inactivating the yeast's own enzymes by heat treatment. After this the RNA has to be liberated by an enzymatic treatment of the yeast with proteases. The next step is to use the enzyme phosphodiesterase to break down the RNA into 5'nucleotides. This results in a Yeast Extract containing 5'GMP, 5'AMP, 5'CMP and 5'UMP. By using another enzyme, deaminase, 5'AMP can be transformed into 5'IMP, which also has flavour-enhancing properties. Further downstream processing of Yeast Extract with natural nucleotides is the same as for traditional Yeast Extract : clarification, concentration to a liquid or a paste, or spray drying into a powder.