

# Enzyme Blends



## HISTORY

Enzymes are naturally present in living organisms such as animals, plants, bacteria and fungi. In the late 17th and early 18th centuries, the digestion of meats and conversion of starch to sugars by plant extracts and saliva were known, but the mechanisms had not been identified. The first enzyme, diastase, was discovered in 1833 by French Chemist Anselme Payen.

## PRODUCTION

Commercial enzymes are produced by fermentation of microorganisms such as bacteria and fungi. Microorganisms are only used in the fermentation process and then are filtered out of the final enzyme product.

An enzyme is a protein catalyst that makes chemical changes in biological systems, including food applications. There are various categories of enzymes used in baked goods including hydrolases, oxidoreductases and transferases. Common enzymes used in baking applications include: protease, lipase, amylases, cellulase, xylanase and maltase. Certain enzymes, including amylase and protease, can be used as a clean label alternative to traditional preservatives and emulsifiers like sodium stearoyl lactylate (SSL) and mono- and diglycerides.

Formulation is important when using enzymes in baking applications. For optimal enzyme performance, processing conditions such as pH, temperature, order of addition and dispersion need to be carefully monitored. Enzymes are classified as GRAS (Generally Recognized as Safe) to be used as food additives in the United States. The FDA regulates their source of origin and established limited based on GMP.

## APPLICATIONS

In baked goods, enzymes can act as:

- Dough conditioners
- Fermentation enhancers
- Anti-staling agents

Enzymes can be combined with:

- propionic acid
- rosemary extract
- green tea extract
- synthetic antioxidants (BHA, BHT, TBHQ)

Format

- dry

Sources:

Mathewson, P.R. Enzymes, 2nd edition, Eagan Press Handbook Series, AACC International, Inc., 1998, pp. 1–105.

Kuddus, M. "Introduction to Food Enzymes." Enzymes in Food Biotechnology. Production, Applications, and Future Prospects, Academic Press, Elsevier Inc., 2019, pp. 1–18.

Smith, J. "Enzymes." Food Additives Data Book, 2nd edition, Blackwell Publishing Ltd., 2011, pp. 366–454.

Williams HS (1904). A History of Science: in Five Volumes. Volume IV: Modern Development of the Chemical and Biological Sciences. Harper and Brothers.

<https://amfep.org/about-enzymes/production/>

